

**HOT NEW STUFF FOR '92**

February 1992

# Radio Control **CAR ACTION**

47380

MISS THUNDERDOME



**25**  
**ADD-ON**  
Performance Parts

**AIR FORCE!**  
WING TECH

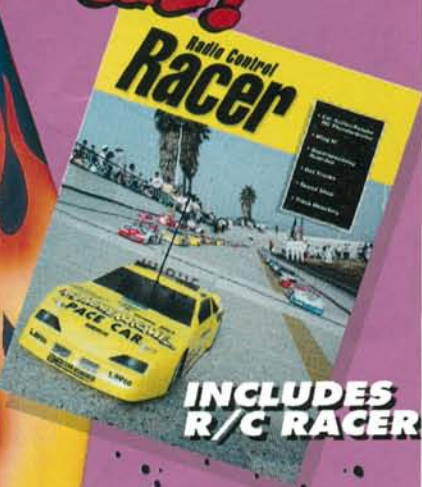
**Superspeedway**  
**ROUNDUP**

**ROAR '91**  
Stock Motor Shootout  
**WHICH RULES?**

**KYOSHO'S**  
**NEW BAD BOY**  
**LAZER ZX-R**

**WIN BIG!**  
**KYOSHO/CAR ACTION**  
**SWEEPSTAKES!**

**RC THUNDERDOME**  
**SUPER SPEEDWAY**  
**SHOOTOUT!**



**TRAXXAS**  
**TRX-1**

**NEW 2WD CONTENDER?**

USA \$3.95 CANADA \$4.50





# Radio Control CAR ACTION

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**ON THE COVER:** center—the hot new TRX-1 from Traxxas. (Photo by Yamil Sued.) Upper right—Miss Thunderdrome 1991, Renee McCracken. (Photo by Courtland Llauger.)



# EDITORIAL

by STEVE POND



## MOVIN' ON

I'VE BEEN involved with *Car Action* since its inception; in fact, I was working at Air Age Publishing well before *Car Action* was established. I had the opportunity to help with the groundwork for what has become the foremost R/C car publication.

During my time with *Car Action*, the industry grew, and I grew with it as it was transformed from a small, limited hobby to a full-blown, diverse sport. Through it all, I was there with the rest of *Car Action's* staff to bring you up-to-date information on hop-up accessories and cutting-edge technology. Large or small, inexpensive or expensive, we were determined to provide the latest product information.

When I took the position of executive editor, it was like a dream come true. Although it hasn't always been easy (I've often had to be judge and jury, psychologist, doctor, politician and engineer as well as editor), I've always greeted the challenge of meeting the needs of discriminating readers with enthusiasm. Now I've come to a crossroads where I have the opportunity to face new challenges, and I've relinquished my position at *Car Action* to pursue them.

My successor as executive editor will be Frank Masi. Frank has been heavily involved in R/C for a long time. He's a very competent enthusiast with broad technical knowledge that should benefit all of you. He also believes in the high standards that have made *Car Action* what it is. You can rest assured that the magazine will continue to be the industry's best.

As for me, I'm off to the West Coast where I plan to dabble in some R/C racing and, on occasion, write articles for *Car Action*. I've thoroughly enjoyed being at your service, and I wish you all the best of luck. Take care.

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# DAHM'S

## Racing Bodies

TRUCK BODIES - 10th Scale



NEW! COMMANDO™ on RC10T



NEW! COMMANDO™ on JRXT  
THRILLER ST™ & CHEROKEE ST for RC10T  
Ford Ranger, Chevy S10, '32 Ford Panel,  
Dodge Dakota, Nissan Pathfinder, Super  
Sport 454, Jeep Cherokee, Avenger  
2000™, Ford Aerostar Van, Camino 2000™  
ON ROAD BODIES - 10th Scale



LUMINA PRO STOCK (D101PS)  
T-BIRD PRO STOCK (D103PS)  
PONTIAC PRO STOCK (D102PS)



'91 CHEVY LUMINA NASCAR  
'90 & '91 THUNDERBIRD NASCAR  
'90 & '91 GRAND PRIX NASCAR  
NEW! - '92 OLDS CUTLASS NASCAR  
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# LETTERS

**WRITE TO US!** We welcome your comments and suggestions. Letters should be addressed to "Letters," Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

## ENOUGH ASSOCIATED!

I bought a JR-X2 about seven months ago (before that, I was into monster trucks). I've subscribed to your magazine for about three years and think it's great, but I do have one complaint. In the December '90 and August '91 issues, you did articles on Cliff Lett and Masami Hirotsuka's RC10s. I liked the articles, but I think you should do some on JR-X2s and JRX-Pros. I'm not saying you should stop doing RC10 articles, because you shouldn't, but I think JR-X2 and JRX-Pro owners would also like to see what the big names in racing use! Keep up the great work!

KYLE KOZUBAL  
Hammond, IN

I agree. One of the best ways to improve your car or truck is to find out what the pros do, and we have something special in store for those who own Losi vehicles! In our next "Monster and Racing Truck" special issue, we'll include a full-color pullout poster of Jumpin' Jack Johnson's Nats-winning Losi LX-T prototype racing truck. Also, in upcoming issues of Car Action, we plan to feature '91 ROAR Off-Road Nats 2WD Stock and Modified champion Kyle Reed's winning Losi Pro-SE prototype and "Track Reports" on the production version of the Losi SE and the new Losi LX-T truck.

FM

## LOOK IT UP

Your magazine is the best. I'm 13 and own a Team Losi Junior T. I have only two questions. How can I make my truck go fast and still keep it stock? What do "i.e." and "e.g." mean? Please help. Thank you.

MATT YEAMANS  
Ashland, OR

A very good question, "...go fast and still keep it stock?" Make sure that you have a pack of well-cared-for batteries (SCRs are recommended) and a stock motor that has been maintained properly. (See "Stock Motor Maintenance" in the October '91 issue.) Aside from that, practice with your Junior T. Learn how it works so that you can make subtle changes to it that will enhance its performance. Also, the time you spend driving will help you to improve your skills immensely.

For your second question, I decided to put you in the capable hands of one of Car Action's editorial people (they're the folks who make us look so smart!) FM

Matt, the solution is simple (I'll skip the Latin lesson). Just replace the abbreviations with the following: i.e.—in other words; e.g.—for example. Also, pay attention in English class—it does have some uses—or do what I do: look things up! KJ

## KNOBBY NEWS

In the article "Inside Masami's Cars" in the August '91 issue, you show an RC10 (on page 45), and its parts are labeled. Number 12 says that the rear tires have been cut down. Why? If they have to be cut, why doesn't Team Losi do it before the tires are sold?

BRIAN MURPHY  
Jasper, IN

No two off-road tracks have exactly the same surface. Some are hard-packed; others are soft and fluffy; still others are a combination of the two. The length of the spikes you use will be determined by the surface on which the car will run. The softer the track, the longer the spikes should be. Long spikes can't dig into hard-packed tracks, so you must trim them to prevent them from folding over or forcing the tire body inwards. FM



## DID I MAKE YOU FEEL ALL "OOOGY"?

I'm new to R/C racing, and I'm thinking about buying the Tamiya Bear Hawk. Is this car good for beginners? Is it easy to assemble and maintain? Which hop-up parts (if any) do you recommend for racing? Your magazine is the best. Keep it coming.

Your number-one fan,  
AARON YOUNG  
Ionia, MI

*Our number-one fan!! You don't happen to own a sledgehammer and a 2x4, do you? Anyway, the Tamiya Bear Hawk is a great car with which to start. It's based on Tamiya's Madcap. Tamiya's instructions are among the best in the business, and the Bear Hawk comes with everything you need to get started except a 2-channel radio, a battery pack and a charger. At this point, don't worry about hopping-up your car. Instead, drive as much as you can. The best "hop-up" is a good driver.*

FM

## DYNO DILEMMA

I'm very disappointed that you ran Frank Masi's article on the Tekin Dyno. In my opinion, it was a paid advertisement. If he had really checked it out (instead of letting Tekin hand him a propaganda sheet), he would never have printed the results.

Tekin's Dyno is a poor attempt at a good idea. They released it before it was perfected. It's vague, inconsistent and, worst of all, dangerous. In the Dyno's manual, Tekin even states that you shouldn't believe the readings. In one place it says, "You get the right reading every time," but further on, it says to test the motor at least *three* times to get the "best" reading.

I've had to send my Dyno back to the company twice. I've spoken to and corresponded with the people at Tekin. The tach readings this Dyno provides vary by as many as 400rpm, even though

(Continued on page 10)

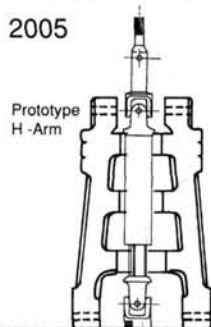
# New In '92

RC-10 and  
2003 RC-10  
System w/H  
2005 RC-10  
System w/H

2001 RC-10 Telescoping Drive System  
w/H-Arm for MIP & J Car 64.95

2002 RC-10 Telescoping Drive System  
w/H-Arm for Trackmaster w/H-Arm 6

2005



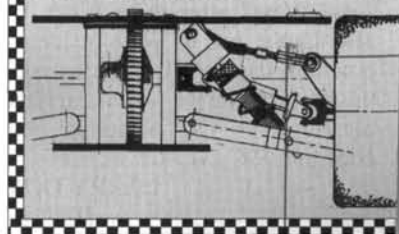
## CUSTOM WORKS & TI

2080 C/W & Titan Hard Anodized Sh  
2081 C/W & Titan Aluminum Spring I  
2084 C/W & Titan Aluminum 'Double



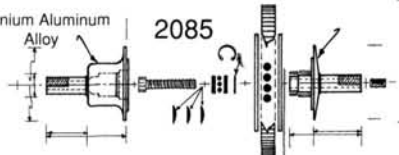
2083 C/W Intimidator Telescoping  
Drive System 54.95

2085 C/W Intimidator Lite Weight  
ProBall Diff. 44.95



Titanium Aluminum  
Alloy

2085



RC-10, JRX Pro, and Ultima Oval  
Chassis Available

Special Thanks for Rod Ward, Mike Bell and Team  
Riverside for support and R&D.



# LETTERS

(Continued from page 9)

I can't hear the variations. The unit overheats very quickly, and this leads me to question even the vague results I've achieved with it.

Its design invites disaster. Its wires have large alligator clips, and the instructions suggest that you connect them to shunt wires on the motors. The motors are set in an aluminum heat sink, and you must be extremely careful not to short-out the clips on it. I replaced them with insulated connectors and soldered the slave motor directly. This reduced the possibility of a short circuit, but then I discovered a really dangerous problem.

I hooked up a motor to test it and, suddenly, I had a fire! I pulled everything off and checked for obvious problems, but I couldn't find any. After careful investigation and experimentation, I discovered that a circuit was somehow being completed through the can.

The motor will run well but, when you touch the hold-down spring to its can, the spring will glow bright red and, if you don't act quickly, this will start a fire. (I'm sure you can see the potential for injury.)

Not only did you recommend a product that, by the manufacturer's own admission, can't provide consistent readings (only a "best-guess" after three tries), but you also chose *not* to warn readers of its potential dangers. I wrote to you about this twice before the November issue came out, so don't say that nobody told you. Nice job, *R/C Car Action*.

LARRY DOMMER  
Hammond, IN

*Larry, after reading your letter, I called Tekin to verify your story and to find out if there was, in fact, something wrong with your particular Dyno. The people at Tekin remember you and say that your Dyno isn't defective. As for your other allegations, your letter is the only one we've ever received that mentioned such problems. To you, I suppose, this simply means that everyone else who owns a Tekin Dyno and who hasn't sent us a letter similar to yours is on the Tekin payroll, as you suggest that I am.*

*As for the readings being vague at best, do you even know how to use your Dyno, or how it works? The only reading that takes a little finesse to achieve is the power reading. In my article, I stated that you should never depress the power-test button for more than a few seconds. (The accurate reading is shown a few seconds after you've pushed the button.) If you hold it down too long, the motor and the Dyno will overheat. The power readings stabilize after the third time (as stated in the instructions), but the rpm and amp-draw ratings stabilize almost instantly (providing the test motor isn't too worn), and there's a minimal fluctuation.*

*No one I've talked to can figure out what you're doing to cause the hold-down springs to glow. What are you using for a power supply? A nuclear reactor?*

*Your letter has me peeved! You're blaming everyone but yourself for your problems with the Tekin Dyno. You decided that you couldn't possibly be doing anything wrong so, obviously, the Dyno must be defective. If you're convinced that the Dyno is inaccurate and dangerous, why not sell it to someone who knows how to use it correctly?* FM

## CANADIAN QUANDARY

In your November issue, I came upon two vehicles that interested me. One is a gas-powered, on-road racer that's made by a company called Team Serpent and distributed by R/C Motorsports of Miami. The other is also a gas-powered vehicle—the new 1/9-scale Kyosho Pathfinder. I really want more information.

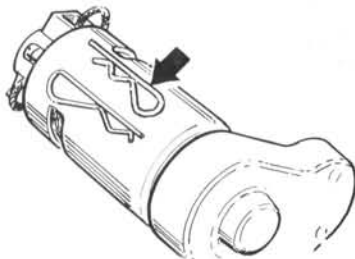
THOMAS KUKLA  
Kitchener, Ontario, Canada

*Thomas, for more information on the Serpent Impact 10, watch for our upcoming review, or contact R/C Motorsports of Miami, 4715th St., Ste. 204, Miami, FL 33014; (305) 620-0005. To find out more about the Kyosho Pathfinder, write to Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61824-4021.* LA



# PIT TIPS

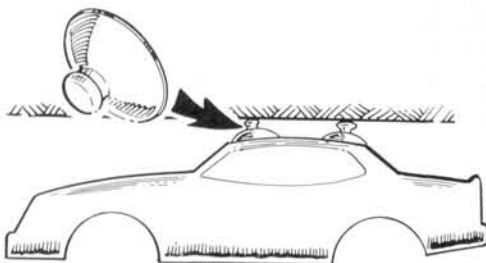
by JIM NEWMAN



## BODY-CLIP HOLDER

To prevent the body clips from being lost while you work on your car, put them on the motor can. The field magnets inside the can will hold the clips securely in place until you need to install the body.

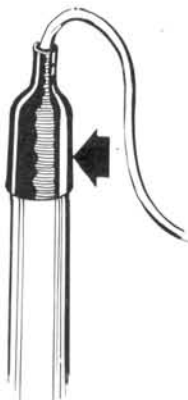
*Shane Willoby, Phoenix, AZ*



## MOUNT FOR SPRAY PAINTING

Attach soft plastic suction cups (available at dime stores) to the roof of a car body to hold it off the bench while you spray paint its interior. This will minimize the possibility of damaging the exterior of the body.

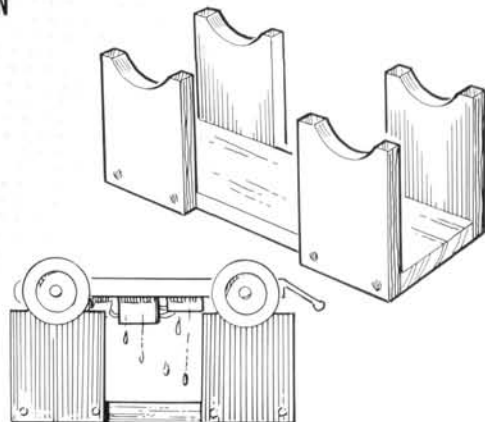
*David Garner, Arcadia, CA*



## ANTENNA SECURITY

Here's a neat way to secure the end of the antenna where it exits the mast. Put a small piece of heat-shrink tubing over the mast and the antenna wire, and shrink it in place securely.

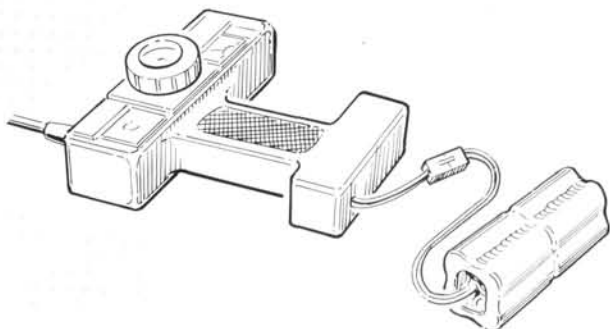
*Troy LeMarr, Beardstown, IL*



## CAR DRIP STAND

This handy car stand is perfect after you've been driving in the rain or snow, and you can make it of common materials—wood, Masonite hardboard products, etc. Remove the body, invert the car, set it on the stand and put a cloth on the base. Water will drip out onto the cloth.

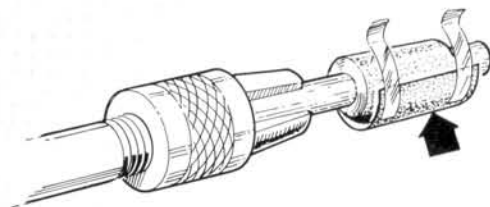
*Aron Bernier, Itasca, IL*



## NI-CDS INSTEAD OF DRY BATTERIES

If you solder a pair of leads to the battery tabs inside the transmitter, you can use rechargeable Ni-Cd batteries instead of dry cells. Just slip the Ni-Cd pack into your pocket, or make a clip and hang the pack on your belt. The connector in the lead will enable you to replace the battery quickly or plug in a charger.

*Chris Foray, Lockport, IL*



## HANDY SANDING DRUM

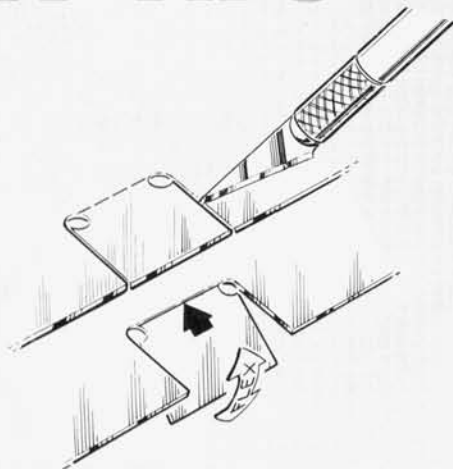
Wrap a 1 1/2-inch-wide strip of sandpaper around a 1/4-inch dowel in the direction shown. Secure the sandpaper with tape, or apply a little CA to its edges. Insert the dowel into an electric drill bit, and you have a handy sanding drum that's perfect for finishing the edges of wheel cutouts, etc.

*Jeff Pieper, Strasburg, IL*

Radio Control Car Action will give a free one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send rough sketch to Jim Newman, c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. Because of the number of ideas we receive, we cannot acknowledge each one, nor can we return unused material.



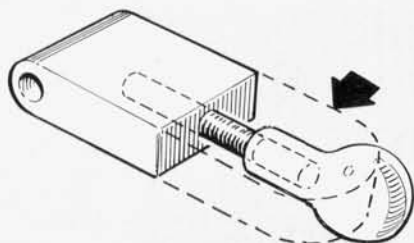
# PIT TIPS



## EASY NOTCH CUTTING

This tip will make it easier to trim polycarbonate bodies. Drill two  $\frac{1}{16}$ - or  $\frac{3}{32}$ -inch-diameter holes as shown. Cut up to the holes and then score carefully between them using a sharp hobby knife. After you've moved this "tab" up and down a few times, the plastic will pop out cleanly.

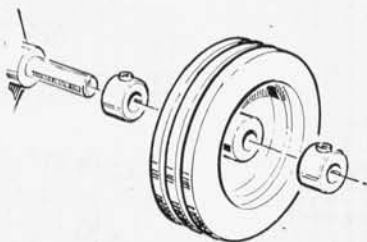
*Lionel Chin Yew Wah, Singapore*



## DOUBLE-DARE CAMBER ADJUSTMENT

Remove part of the suspension control arm (shown by the dotted line), and drill a hole into the end of it. Screw a piece of threaded rod into the hole, and screw a heavy-duty ball joint that will mate with the hub carrier onto the end of the rod.

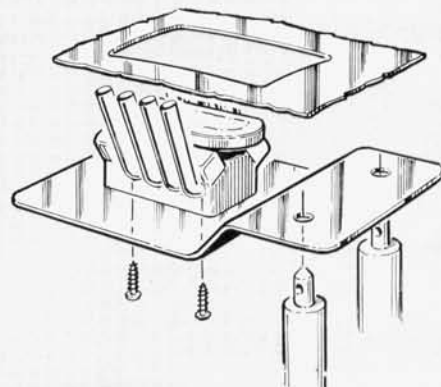
*Brent Black, Newport News, VA*



## ELIMINATE E-CLIPS

Instead of using E-clips on your car's axles, use collars similar to those supplied for the tie rods on RC10s. (The collars used on model airplanes work, too.) You might have to remove the plastic washers from the axles before you install the collars.

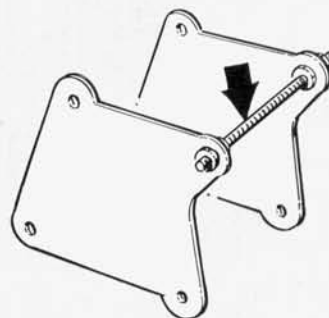
*Mike Dawson, Tucson, AZ*



## HI-RIDER CORVETTE TIP

If the plastic "dummy" motor that's mounted to your car's hood keeps falling off, try this. Cut an opening of the appropriate size in the top of the hood, and then cut and bend an aluminum bracket so that it's trapped by the body mounts. Drill two holes in the bracket, and secure the motor by screwing a couple of sheet metal screws in from below.

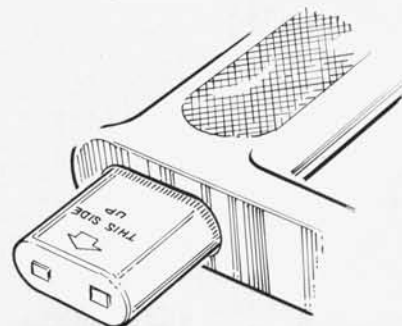
*Todd Frizzelle, Caledonia, Ontario, Canada*



## SHOCK-TOWER STRENGTHENING

Under severe conditions, shock towers can bend or even break. To brace them, install a piece of a threaded rod (6-32 minimum size) with four nuts as shown.

*Robert Helm, West Branch, IA*



## ELIMINATE FLAT BATTERIES

Do you find that your transmitter gets turned on accidentally while you're transporting it? To avoid flat transmitter batteries, install the pack upside-down (shown), and then install it properly when you reach the track.

*Jason Schneider, Anaheim, CA*

# INSIDE SCOOP



As directed by the Ayatollah of Radio Controlla, Commander Crash Chianelli reporting back to the faithful followers of the Grand High Exalted with pertinent information! I'm back from my latest espionage excursion with microfilm, spy shots and stolen communique that read as follows:

b y C H R I S C H I A N E L L I



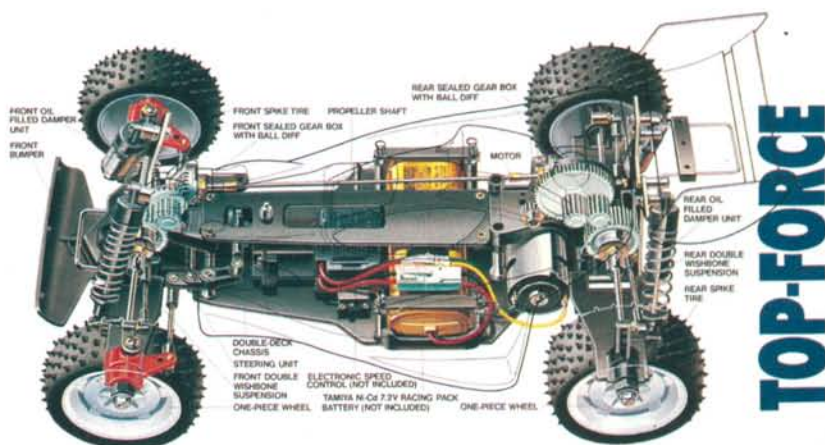
## JOIN THE TEAM

Trinity Products says that, owing to its recently revamped battery-processing department, it can turn out more Pushed Team cells so they'll be available to all racers. The packs are matched at a 20A discharge rate with a .90V cutoff point. The SCRs run for 300 seconds and more—the SCEs, for 350 seconds and more.

## TOP-FORCE



First, there was the Super Astute; now, there's the Top-Force—Tamiya's latest high-performance car. It features a fiberglass, double-deck chassis; a shaft drive; a wishbone suspension with adjustable upper links all around; but, like the Super Astute, the Top-Force kit doesn't include a mechanical speed controller. (Tamiya understands that performance-minded racers will opt for electronic units.) Tamiya certainly has the ability to produce good, competition-worthy cars. The Super Astute and the Top-Force are examples of the company's new attitude; so why does it still include plastic shocks with these kits instead of high-quality metal units like those found on the Egress? Someday, we may know!



TOP-FORCE



## Know thine Enemy

Owing to the recent Losi/Trinity sweep of the ROAR Off-Road Nationals, Team Associated has resorted to espionage and persuasion to uncover the secrets of this success. Here, the happy (and unsuspecting) Joel and Gil of the Losi/Trinity coalition are targeted by two of Associated's spies, "Nina" and "Sandra" (Natasha and Katrina). Hey, employing pretty women for such jobs—and these *are* pretty women—works for the Russians. These two American gents are easy prey for the experienced Mata Haris!



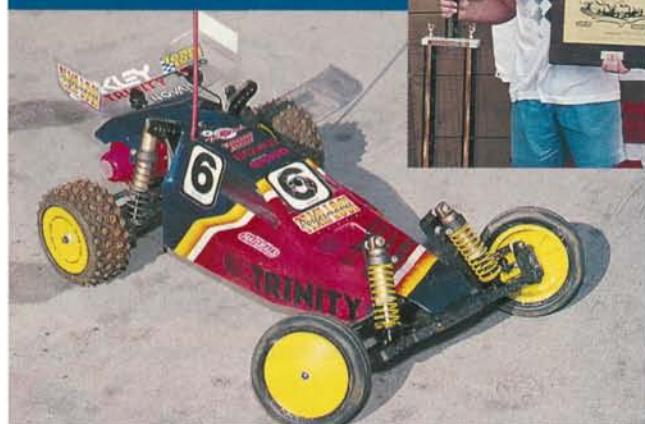


## new 1/10-scale speed record

During the Insane Run at this year's *Car Action* RC Thunderdrome, Kent Clausen's 10LSS obtained an average speed of 73.23mph, with a top speed of 75.92! The car was equipped with 12 cells, a 13-turn, double-wind Reedy Mr. M motor, TRC's new wraparound radials on composite wheels and Associated's new narrow Jaguar XJR-16 body. The car and the speed record were dedicated to Lisa Curtis, wife of Roger Curtis of Associated Electronics, who died on September 10, 1991.

## KYLE CLEANS THEIR CLOCKS

Losi/Trinity driver Kyle "Speed Racer" Reed won the 2WD Modified and 2WD Stock classes at this year's Off-Road Nationals in Savannah, GA. In both races, he ran what Team Losi calls the JRX-Pro "XX," which uses the new—and less expensive—molded, matrix fiber/resin composite ultra-stiff chassis. Team Losi now offers a version of the "XX"—the JRX-Pro SE (Special Edition)—that also features Teflon pistons, hard-coated shock bodies and a friction slipper that will accept the "hydra-drive" when it becomes available.



## THOSE SILLY '60s

Although this R/C '62 Chevy Corvair, named "Unie," looked silly with its top hat and its functional batting eyelashes, the project was far from meaningless. The full-scale R/C car, probably the first of its type, appeared at auto shows and actually talked to onlookers. Unie was invented by the famous R/C visionary, Dick Branstner, the man who pioneered the remote control for our TV sets! The beautiful girl in the photo is Betty Kramden—Alice's younger sister.







The 2nd-place car, sponsored by Japan's *RC Magazine*, is shown here with detail shots. Note the Tamiya oil shock.



## SOLAR ROLL-ON



Top: the 1st-place, 15-cell Tamiya car has a Manta Ray nose. Above: the two rows of 15 cells in the 3rd-place car gave it a narrower frontal area that really paid off.

Here are the latest developments resulting from the ongoing Japanese interest in solar-powered R/C cars. The cars on this

page were designed for a Tamiya-sponsored speed event in which the entries could use only Tamiya parts and no more than 15 photo-

cells. The car with the Manta Ray nose is Tamiya's entry (it came in 1st), and the one that looks like an ironing board on wheels is

## WHAT'S BLACK AND BLACK AND EARNS YOU GOLD?

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One- and 2-cell cars need ultra-mini equipment. Photo-cells and motor are available from MRC/Tamiya. A non-R/C car is also offered; R/C is conversion feasible.

the 2nd-place finisher that was entered by the Japanese publication, *RC Magazine*. (The detail shots are of this car.) The cars

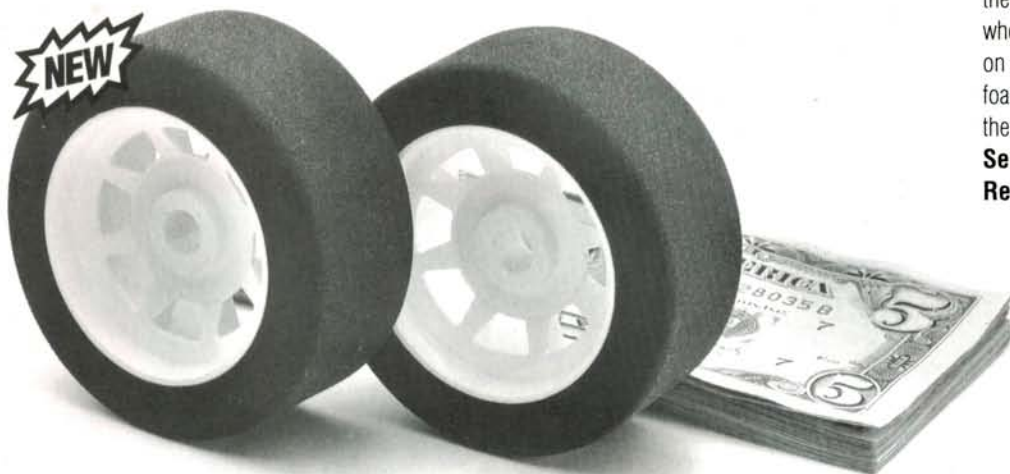
on this page are from the "Solar-Roller Society," the members of which constantly try to "out-miniaturize" one another.

# Ratmobile

ROAR is allegedly considering a new deterrent for racers who are consistently cited for using underhanded tactics, e.g., high-side nerfing. Proponents of the proposal insist that, if repeated offenders of track sportsmanship and pit codes are forced to run their cars with this "rat body" for a full season, they'll be better behaved the following year and abandon their "rat-racing" proclivities.



## WHAT'S BLACK AND WHITE AND SAVES YOU GREEN?



### DYNA-SPORT Street Tires Are The Best Design For Street Racers.

Equip your cul-de-sac racer with some street meat that's not only top quality and great looking ..., but priced for a lot less than you'd imagine. Manufactured for us by the world's leading producer of on-road tires and wheels, Dyna-Sport stock car style wheels look great on every car. And with your choice of three styles of foam composition, you can fine tune your racer to get the perfect handling on your private race course!

**See 'em at your local shop today!**  
**Retails start at \$12.95**



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# READERS' RIDES

"Readers' Rides" is our way of recognizing the unique, innovative—and sometimes bizarre!—vehicles that our readers have created. Send us a sharp, uncluttered, well-exposed color photo of your car or truck (no Polaroids, please!), along with a brief description, to Readers' Rides, R/C Car Action, 251 Danbury Rd., Wilton, CT 06897. If the Ayatollah chooses your photo, you'll receive a one-year subscription to Car Action, or an extension to your existing subscription. You'll also be eligible for the third annual "Reader's Ride of the Year Contest" in the fall of 1992. Write your address and phone number on your letter and on the back of each photo you send, in case we need to contact you.



## ■ SPEEDY SPRINTER

For scale realism, try 1/8-scale gas-powered racing. Not only is it big and fast, but it's incredible fun! Mark Stewart of Heath, OH, built his own 1/8-scale sprinter. He started with a T-Craft chrome/moly chassis, and then he added a front axle, heim joints, a clutch and a gearbox—all from Moody Automotive. Powered by a Nova Rossi .21 engine, modifications abound on this speed machine. In fact, there are too many to list!



## ■ INDY INSANITY

Kent Hering of Pasadena, TX, is a big-time, full-size Indy car fan, so he decided to custom-build an R/C version. This little number is the result of all his cutting, sawing, filing and gluing. It has a T-plate rear suspension, a custom front suspension and interior and a totally detailed body. Kent went all-out!

## ■ FORMULA FUN

Edwin Lee of Ridgely, NJ, has a passion for Formula 1 racing, and he couldn't resist when Kyosho introduced its McLaren Honda model. After assembling the kit, Edwin added a Trinity Joel Johnson modified motor and a Novak T-4 ESC with a micro receiver. Using a set of foam racing tires, Edwin competes regularly at several tracks.





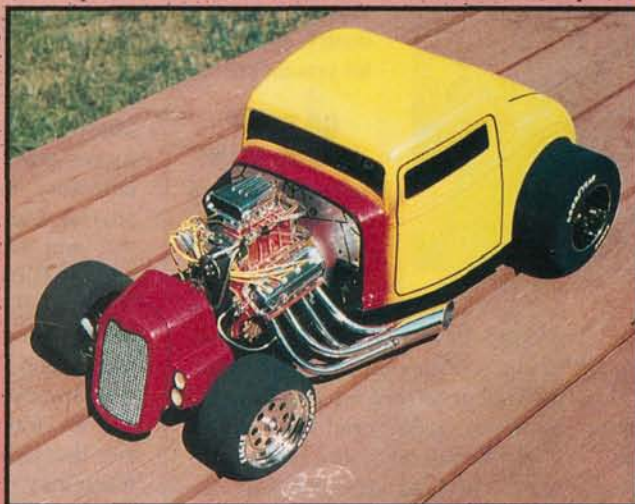


### ■ TEAM ZOO

Douglas Bray of Phoenix, NY, sent us this photo of his RC10 Team Car. Armed with a Slot Machine motor and a Futaba radio system, it's loaded for heavy combat in the fiercely competitive stock class. I'm sure that Douglas is the "leader of the pack"!

### ■ HOT HEMI!

Norman Sizemore of Ft. Wayne, IN—a street-rod kind of guy—went all-out on his Parma Hemi Coupe. He added a new mesh grill, gave the body a "fade" paint job and added plug-wire details to the engine. Custom headers and a full set of lights finish off the car.



### ■ THE CAT'S MEOW?

R.A. Bost of Centralia, IL, is the owner of this fancy feline truck. Don't be fooled by the Shotgun tires and rims; under this Chevy Blazer body is a Schumacher Pro Cat ready to pounce! To control and power this king of the jungle, R.A. uses a Tekin 700-ESC and a Team Losi MTM motor.

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# PUBLISHER'S PAGE

by LOUIS V. DeFRANCESCO JR.



## AN ANNIVERSARY

This issue marks my 10th anniversary in the publishing business. To give you some perspective on how far we've come, with my sister and three employees, I started with only *one* magazine. We took over a financially troubled magazine called *Model Airplane News* and, with perseverance, ingenuity and a commitment to growth, we've grown to six magazines and 75 employees, plus book and mail-order divisions.

But it's you, our readers, whom I thank, because you've supported this growth by choosing our magazines as your favorites. I can reassure you that we'll continue our

tradition of excellence by providing you with the best magazines in the industry. We won't let you down!

## GO WEST, YOUNG MAN!

After six years of dedicated service to Air Age Publishing, *R/C Car Action* Executive

Editor Steve Pond is moving on. Steve's talents as writer and photographer helped in making *Car Action* a success, and I assure you that we'll all miss him. I remember when we first launched *Car Action*: we didn't have much money, and budgets were tight, but Steve believed in the project and, undaunted and with high spirits, he pressed on with me and Chris Chianelli to make it go! We're not letting Steve off easily; we've cajoled him into contributing his talents to the magazine as a freelancer. So, if you're ever at a race in California and see a 6-foot, 5-inch character with a 600mm zoom lens shooting R/C cars, just say, "Hey, Smitty!"

So where does that leave us?—in the capable hands of new Executive Editor Frank Masi. Frank

has been working with us as associate editor, and he brings much to the table, including his many years of R/C experience and two engineering degrees. Expect great things from him!

## INDUSTRY SUPPORT

Many of you have commended us for our new, comprehensive Track Directory and we thank you. We provide it as a service to the industry, and it's free to any track owner. It embodies our commitment to help further the growth of the R/C industry. We want R/C racers and newcomers to know which tracks are available in their regions; traveling R/Cers can also use the Directory to find tracks when they're out of town on business or pleasure. To put *your* track on the map, just fill in the form you'll find later in this issue.

No other company in the R/C media puts back as many dollars as Air Age Publishing does to generate enthusiasm for R/C and bring in newcomers. Massive marketing programs and greater nationwide newsstand and chain-store distribution keep the R/C message strong, and informative publications of the highest quality captivate R/Cers and keep interest levels high. We're here for the distance! ■

*Publisher's protégé Frank Masi (left) gets the Ayatollah of Radio Controlla's blessing as he moves into a new seat in the Car Action office.*



WITH THE ARRIVAL of 1992, several important events come to mind: the Olympics in Spain and France; the presidential election; the 500th anniversary of Columbus reaching America; and February 29—'92 is a leap year. What does this have to do with R/C? Nothing, but it serves as a great intro for our "New for '92" section.

During the past year, manufacturers have been hard at work on new products that will soon hit the market. At Car Action, we've been snooping around

## THE SHAPE OF THINGS TO COME

company testing areas and trade shows to find out what's really new for this year, and we've put together this list of products to start looking for. Make room in your pit space, because here they come!

# New '92 for

## TRX-1

The 2WD TRX-1 car has already made waves. At the '91 Worlds, Scott Montgomery drove his prototype to the 4th qualifying position in the A-Main, and he finished in 7th place overall. The car's new features include a narrower front bulkhead and longer arms to increase the suspension travel and improve the car's turning abilities. Its American-made, ultra-rigid, graphite chassis has a 30-degree kick-up and provides ample room for radio gear. For damping, the TRX-1 uses four hard-anodized shocks with stainless-steel shock shafts and springs, which are colored for easy identification. (With these new, longer shocks, the car's rear end has 2.5 inches of travel!) With an internal ratio of 2.14:1, its tranny provides ratios from 5.56:1 to 15.51:1, and you can adjust its diff without having to disassemble the drive line. Look out!



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## Digi-Peak

Novak's new chargers—the Digi-Peak and the Digi-Peak+—can charge SCR cells at rates ranging from 0 to 10 amps (pulse mode) and SC or SCE cells at rates from 0 to 5 amps (linear mode). To accommodate cells of different sizes, you can adjust the trickle-charge rate from 0 to 300mA in the linear mode. Both chargers use Novak's high-frequency, 10-bit, digital peak-detection circuitry for accurate charges; a 100-second, lock-out circuit to prevent false peaks; and Novak's exclusive Solder Pop Fuse to protect against reverse voltage. The Digi-Peak+ also has a liquid-crystal display (LCD) that shows you the charge current and the battery-pack and source voltages.



N O V A K





## BAJA FOAM TIRES

Trinity now offers the purple Fast Wheels with trued and glued Magic Rubber foam tires. They're available for most popular racing trucks and are great for carpet or asphalt tracks. The tires are 1.9 inches wide, and they have 3.6-inch diameters.



A I R T R O N I C S

## Avenger Series Radios

Airtronics' affordable Avenger Series 2-channel radios have high-quality components and an attractive high-tech appearance, and they provide superior performance. The reliable Avenger AV2R and AV2S are perfect entry-level R/C systems for car and boat enthusiasts. They're compatible with all Airtronics radios, servos and accessories.

DAN'S R/C STUFF

## The Tilter

If you own a Tekin battery charger, you should check out the Tilter. This device holds the charger at an angle, and this provides the charge indicator with better ventilation and also enables you to see it more clearly. Made of rugged yellow plastic, the Tilter comes with Velcro® strips that you can use to fix it to the charger and the stand.



## RC10T

Associated's new RC10T is a serious competition racing truck. Its features include a Stealth tranny, a narrow front bulkhead with extra-long arms, wider rear arms with special hub carriers, longer dogbones, an adjustable servo-saver, redesigned shock struts, race-proven Team shocks and narrow and wide front tires and rims. In its first races, the RC10T showed its true colors, including a one-two sweep at the Florida Winter Champs. Expect to hear a lot more about the RC10T this year.

A S S O C I A T E D E L E C T R I C S





## BLACKFOOT PARTS

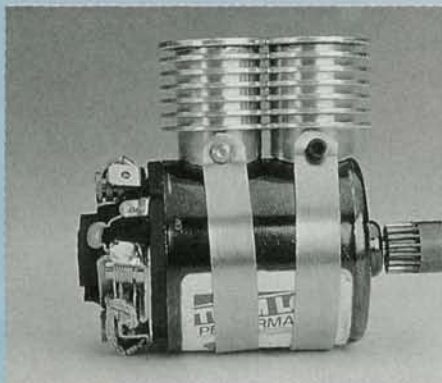
The Scale Depth Box kit enables you to build a realistic stepside pickup bed on your Blackfoot body. It comes

with new body mounts and instructions. Some of the other Blackfoot parts offered by Advanced Engineering include: the Aluminum Diamond Plate Box Floor Liner; the Tailgate Net; Aluminum Front and Rear Bumpers; and the Aluminum Roll Bar.



## HEAT SINK

The new TNT heat sink will effectively reduce the operating temperature of any 540 motor. Inside this unique unit is a thermally conductive liquid that draws heat away from the motor and into the heat magnet. You secure the unit to the motor can with the non-magnetic, stainless-steel strap. For the times when your motor is too hot to handle, TNT also offers a dual heat sink (shown).



## Championship Series Modified Motors

These are the motors that helped Trinity, Losi and Custom Works capture five national modified titles in 1991. They range from the wild Nuclear Melt-down to the mild Joel "Magic"

Johnson, and they feature some very unique winds. Look for the motors with the purple cans.



## H Y P E R S P E E D

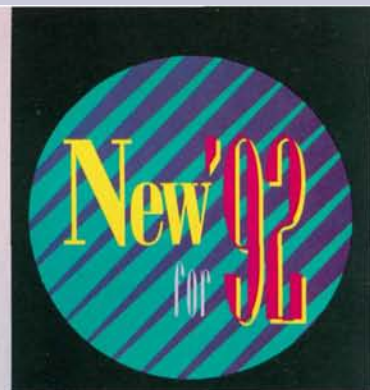
If it's speed you're after, check out Royal's Hyper Speed motorcycle. It's almost identical to the cycle that Royal introduced a few years ago, but now it has a Mabuchi 540 motor and a host of other features. To cope with the power, Royal gave the bike softer tires with treads, an improved suspension and electronic speed controller and a high-speed transmission. If you thought the last Royal cycle was cool, wait till you see this one move at 25mph! It's a scream!



Team A&L proudly introduces the Slam It racing truck body for the S10. The ultra-low fit and aerodynamic styling of this narrow, light body give it a race-ready appearance and a race-winning edge. The Slam It isn't just another monster truck body; it's a trend-setting leader.

## Slam It Truck Body





OUTLAW STOCK MOTORS TRINITY



No Pro-Stock motor with Oilite bushings comes closer to providing sheer power than Trinity's new Psychotic Reaction motor. Designed to be the fastest stock motor allowed under Outlaw rules, this 13-turn single-wind motor has a Trinity/Epic can with 4.9 wet magnets. It has a mild 5-degree timing so its brushes will last a long time. Go mental with the Psychotic or, for larger tracks, try Trinity's Ground Zero motor. It has the same setup and timing as the Psychotic Reaction, but its 15-turn, single-wind armature provides more top speed.



TEAM ASSOCIATED

## YOKOMO NSX

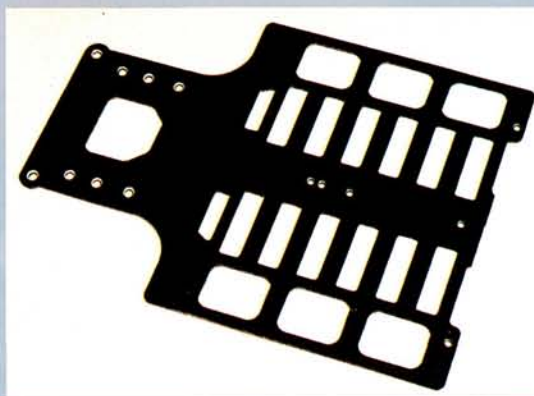
Team Associated is considering importing the new Yokomo NSX. This realistic-looking scale version of the Acura (Honda) NSX features a mid-mounted, direct-drive, "break-away" front suspension (to prevent damage during front-end collisions), and four-wheel independent suspension with upper control links on all four wheels (to enhance the NSX's handling characteristics).



## Thunderbird Pro Stock Body

DAHMS

From the molds of Ira Dahm, the new Thunderbird Pro Stock body is made of crystal-clear, .030-inch-thick Lexan, and it comes with a molded-in hood scoop, twin parachutes and a separate, adjustable wing. To create a super-stiff, aerodynamic shell, use this body with a Dahm's Lexan Ground Effects Thunderbody underbody.



COMPOSITECRAFT

## 10-L Ground Effects Chassis

Using aerodynamics theory, CompositeCraft has designed this chassis to reduce your car's drag and increase downforce. This allows you to either decrease the angle of the wing or use a smaller wing. The minimal weight increase is more than offset by the decrease in drag. The bottom of your car is basically closed off, so the air flow is restricted. The chassis comes with a .010-inch-thick Lexan, vacu-formed plate.



## RC10T Rims

Pro-Line now offers one-piece RC10T rims that accept all popular 2.2-inch tires. They're molded of a new, strong, nylon compound that has a higher resistance to impact. They're also more aerodynamic because they sit flush with the outside of the tires.



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## ENFORCER

Custom Works proudly introduces the first complete sprint-car kit ever to be produced in America. The Enforcer has many of the same suspension and drive-train components as the popular Intimidator dirt-oval car and many new features, too. The kit includes a light, molded-nylon roll cage, which can be dyed, a three-piece sprint-car body and wing, mounted foam tires, a graphite chassis and a unique Custom Works battery cradle.



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## New Eagle Parts

By modifying the rear end of the popular Blue Eagle, Traxxas has made it better than ever. The new parts include longer, hard-anodized shocks, a taller rear shock tower, longer rear arms and new sliders, axles and dish rims. If you want your Blue Eagle to perform to the max, these parts are a must.

## 411G Electronic Speed Controller

The Tekin 411G ESC is an updated version of the popular 411P. The "G" stands for "Goldfets"—the state-of the art, low-voltage-drop transistors that have replaced the standard ones. The use of thicker 15-gauge wire also reduces the voltage drop. When you run receiver packs, you can use an isolated ground-wiring system, which will increase the radio range. The 411G is rated for 300 amps continuous and 1,050 amps peak.



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## Battery Jig

CompositeCraft's glass-filled-nylon, injection-molded Battery Jig holds seven cells vertically in place for easy soldering. The jig comes in pink, yellow, blue, and orange, and it makes building your packs a snap.





CENTURY IMPORT & EXPORT

## Pro-65 Truck Tires



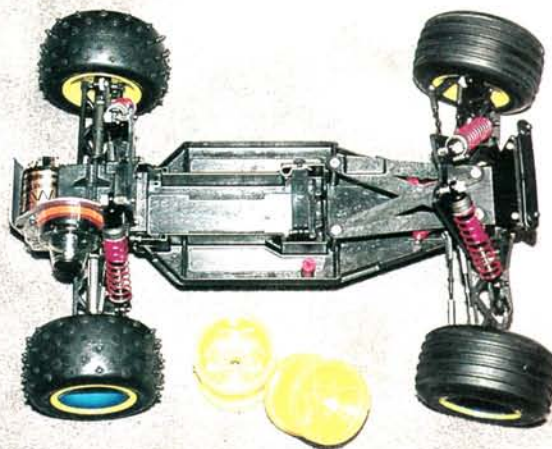
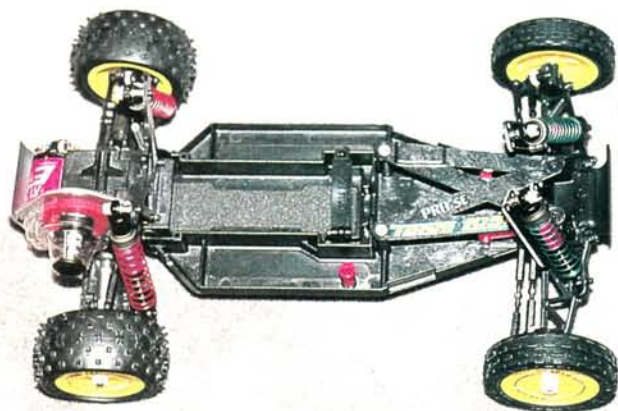
PRO-LINE

Pro-Line's new Pro-65 truck tires are made with the same rubber compound that was used in the popular 7080 and 7090 tires. The Pro-65's tread design of fine ribs and staggered bars provides great straight-line stability and plenty of side bite for tight corners and sweepers. They fit all standard 2.2-inch truck rims.



## M-1 Abrams Tank

New for all you tread heads out there is the 1/14-scale gas-powered M-1 Abrams tank. The model is 650mm long, 270mm wide and weighs in at 24 pounds. It's powered by any 2-stroke engine from .21 to .35, and it's controlled by a standard 2-channel radio.



T E A M L O S I

JRX-PRO SE

The very latest in state-of-the-art 2WD off-road racing technology is now offered in Team Losi's new JRX-Pro SE. Incorporating many of the modifications used on the Losi "Worlds" car that Kyle Reed used to dominate the ROAR Off-Road Nationals, the SE features; new friction-type slipper that will accept Losi's new "Hydradrive" traction control when it becomes available; "swept" front A-arms; hard-coated shocks; matrix-fiber composite molded chassis. Look for this car in a Winners' Circle near you.

Fresh from their victory at the '91 ROAR Truck Nationals, Team Losi has introduced the production version of Jumpin' Jack Johnson's winning prototype truck—the Losi LX-T. This new "stadium" racer features new suspension geometry both front and rear with longer A-arms, a molded composite chassis similar to the Junior T's, and a new friction-type slipper that will accept Losi's forthcoming "Hydradrive" traction control unit. The LX-T also comes with new light, one-piece wheels with "snap-in" dirt shields.









TRAXXAS

# TRX-1

by FRANK MASSI



# TEXAS TERMINI



**H**OW FAR MUST you depart from the norm to achieve true originality? Too far. To design a successful R/C off-road car, you have to find out what works and go from there. Traxxas\*—one of the new boys on the block—has done precisely that, so when you look at its newest car design (and all other new designs, for that matter), you might think that there's nothing new under the sun.

Its new 2WD car, the TRX-1, could be called "derivative," but it works, and works well. I'll let its track record speak for itself: in the hands of team Traxxas driver Scott Montgomery, it qualified 4th at the recent IFMAR Off-Road World Championships in Detroit; at the '91 ROAR Off-Road Nationals in Georgia, Traxxas managed to place a TRX-1 in both the Stock and the Modified A-Mains (not bad for a new car competing essentially in box-stock form).

### COMPETITION COMPONENTS

The TRX-1 is based on the Traxxas Blue Eagle racing truck, and it shares some of its suspension and chassis components. Starting up front, the TRX-1 has the narrow bulkhead/long A-arm suspension that many manufacturers have adopted. Additionally, a tall front shock tower is used with shocks of the appropriate length. The long front shocks make the most of the travel afforded by the long A-arms; they enable each front wheel to travel farther upward when the car encounters large obstacles, and this reduces the chance of rollovers. The TRX-1 also has in-line steering blocks to reduce wheel scrub (lateral wheel movement) in turns.

The TRX-1's graphite chassis is one of the most rigid I've ever seen on an R/C car. Traxxas achieves this stiffness without resorting to a thicker-than-usual graphite composite. You won't have to invest in an after-market steering bellcrank when you buy a TRX-1; the unit comes complete with a set of aluminum steering posts, nylon bellcranks and a composite sector arm that provides precise, slop-free steering with the proper geometry.

The TRX-1's rear-end design revolves around a new transmission that features a fully sealed gearbox that contains a fully adjustable ball differential. Set the diff simply by inserting an Allen wrench through a hole in the gear case and turning the opposite wheel—no need to disassemble anything.



## the name game

If you haven't been following the story, the new Traxxas car went through several name changes before it was called the TRX-1. When Traxxas was satisfied enough with the prototype 2WD off-road racer to begin production and then advertising, they settled on the name *Vector*. But Airtronics—one of the leading radio manufacturers—already offers a two-stick transmitter called—you guessed it—the *Vector*. To avoid any possible confusion, Traxxas decided to change the new car's name to *Talon* (a suitable name because Traxxas also makes the Blue Eagle).

Well, you can pretty much figure out what happened next—Chrysler/Jeep/Eagle; that's what happened! The company sells a version of Mitsubishi's Eclipse called the *Talon*, and rather than go through the hassle of acquiring the rights to use the name, Traxxas finally changed the name of its 2WD car to the TRX-1.

Traxxas has copyrighted the name, having determined this to be the safest path on which to travel. So, if you think that Traxxas has just introduced three separate 2WD off-road race cars, think again; they're all the same car—just different names.

PHOTOS BY JOHN HUBER

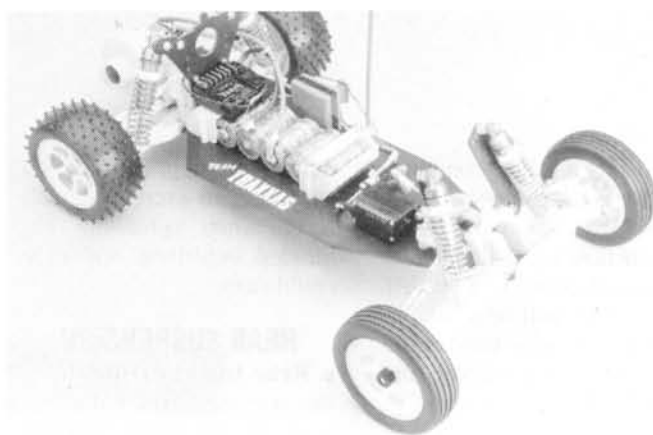
# N A T O R !



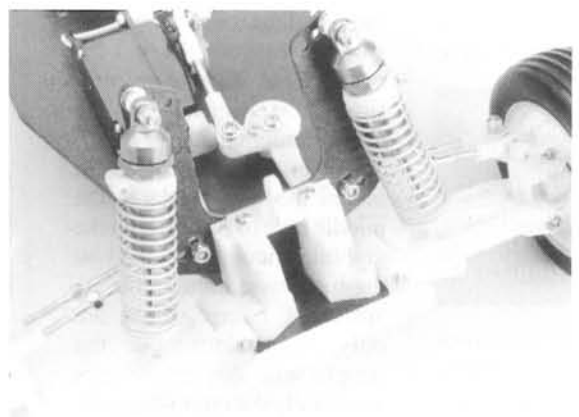
In keeping with current technology, this new Traxxas "box" has a slipper clutch that works independently of the diff. The system uses Rulon pegs that are inserted into the spur gear where diff balls are usually found. Slip is adjusted by means of a nylon locknut that controls the tension of a pressure spring.

The TRX-1's rear suspension has received the same treatment as the front—

longer-than-usual A-arms whose outboard pick-up points are well inside the rear wheels. Again, this helps to eliminate wheel scrub and makes the car more stable on rough tracks. The TRX-1's front shocks and the extra-long rear shocks have hard-anodized, Teflon-coated bodies for smooth operation and increased durability. (Although the front shocks on the TRX-1 shown here are blue-



*With its TRX-1, Traxxas is making a bid for 2WD off-road supremacy. This serious machine has many winning features, including a narrow bulkhead with extra-long front A-arms and a low-drag transmission that uses a slipper clutch.*



*The front A-arm mounts are attached to the nose of the graphite chassis plate, which has approximately 30 degrees of built-in kick-up. To vary the caster, Traxxas supplies shims that can be put between the chassis and the A-arm mounts.*

anodized, full production models will include the hard-coated bodies up front as well.)

### TRAXXASSEMBLY

The kit I received for review was a pre-production one, and at the time, the instruction manual hadn't been completed. Traxxas had only been able to send me the text to the manual—no pictures—so I pretty much had to "wing it."

● **Transmission.** Assembly

begins with the transmission, which goes together in a straightforward way. I was able to build it without pictures, and that's a testimony to the quality of the Traxxas instructions.

Pay extra attention during step A-7. Be sure that, after assembly, the round edge of the diff rings will face the diff gear. I chose Associated's\* Stealth Diff Lube for the main diff balls and its Black Grease on the thrust bearing. I've

Type ..... 2WD off-road  
Scale ..... 1/10  
Price ..... \$345

#### DIMENSIONS:

Overall length ..... 16 inches  
Width ..... 9.75 inches  
Wheelbase ..... 11.125 inches  
Front track ..... 8.75 inches  
Rear track ..... 7.875 inches

#### WEIGHT:

Gross (with battery) ... 3 pounds, 5 ounces

#### BODY:

Type ..... Single-seat buggy  
Material ..... Polycarbonate

#### CHASSIS:

Type ..... One-piece plate with 30° kick-up  
Material ..... Graphite

#### DRIVE TRAIN:

Primary ..... Pinion/spur gear  
Transmission ..... Three gear (2.14:1 ratio)  
Differential .. Externally adjustable ball diff  
Bearings/Bushings ..... Ball bearings

## TRAXXAS CORPORATION

## TRX-1



#### SUSPENSION:

Front/Rear: Type ..... Independent A-arm with upper link  
Damping ..... Oil-filled coil-over shocks

#### WHEELS:

Front: Type ..... One-piece molded nylon  
Dimensions (DxW) . 2.1x0.875 inches  
Rear: Type .....  
Dimensions (DxW) ..... 2x1.25 inches

#### TIRES:

Front ..... Six-row ribbed (#4740)  
Rear ..... Pin spikes (#4750)

#### ELECTRICS:

Motor ..... 05/540\*  
Battery ..... 6 or 7 sub-C cells\*  
Speed controller ..... Electronic\*

\* not included

#### OPTIONS AS TESTED:

Futaba S132H servo;  
Novak NER-3FM 3-channel receiver; Tekin TSC-411P electronic speed controller; Trinity Pushed 6-cell SCR battery pack; Trinity Speed Metal 12-turn, triple, modified motor.

#### COMMENTS:

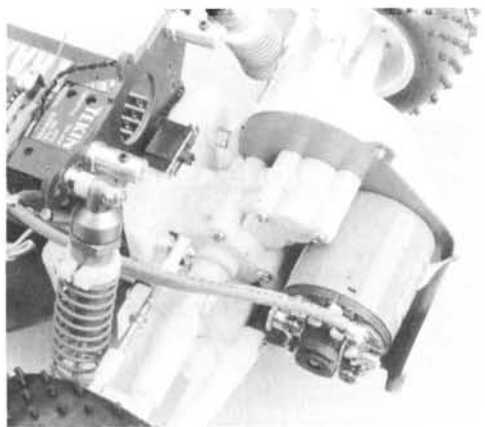
With its new car, Traxxas is fast becoming a force to be reckoned with in racing. Devotees of other cars will probably dismiss the TRX-1 as a "rip-off," but it's a real performer that will undoubtedly find its way into many winners' circles.



been using this lube combination for some time because it works exceptionally well. (Production kits will include Traxxas's own silicone diff lube, which will be available in two viscosities: thin for the main diff and a thicker formula for thrust bearings.)



*The TRX-1's rear suspension may look conventional, but the rear A-arms are extra-long and have out-board pick-up points well inside the rear wheels. The Teflon-coated shock bodies have been hard-anodized.*



*The design of the TRX-1's transmission is familiar. Housed in the gear case is Traxxas's excellent ball diff, which can be adjusted externally (no need to disassemble the car). Power is transferred to the wheels by means of universal slider shafts.*

When the transmission is complete, attach one half of each drive shaft to both diff outdrives. The TRX-1 has universal-joint slider shafts that are similar in design to those from Schumacher and Losi. They must be installed with a special tool that's included in the kit. Take care

during this step, because it's very easy to exert too much force when spreading the molded outdrives, and they could snap.

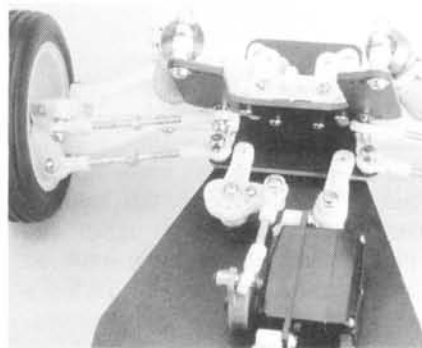
## REAR SUSPENSION

● **Rear toe-in.** Next, attach the rear-suspension components to the main chassis. Molded mounts hold the rear A-arms on the chassis. When building the car, you have a choice between two sets of these mounts; one set is marked 0 degrees, and the other is designated as having

*"The most noticeable effects of the car's front-end design were its high degree of lateral (side-to-side) stability and its considerable front-end 'dive' when cornering and braking. This 'dive' transfers a greater percentage of the car's weight to the front tires, and this increases their traction."*

1 degree. The TRX-1's rear arms have approximately 3 degrees built in, so when the 0-degree toe-in blocks are used, overall rear toe-in is 3 degrees. By using the 1-degree blocks, you can set rear toe-in to 4 degrees (1 degree,

plus the 3 degrees that are built-in to the rear A-arms; just install the block with the + sign facing the rear of the car), or 2 degrees (install the block with the + sign facing forward). While assembling the rear suspension, something became obvious to me: these E-clips were more dif-



*There's no need to buy after-market steering components; the kit's bellcrank system provides precise, slop-free steering and its geometry prevents bump-steer. The included turn-buckle tie-rods make adjustments a breeze.*

ficult to install than any I had ever seen! (Maybe the plating on the hinge pins made things difficult.) Anyway, they'll never pop off!

● **Rear anti-squat.** The rear A-arm mounts are molded to

have 0 degrees of anti-squat (rear-suspension caster). Achieve anti-squat by putting the provided caster shims under the mounts before you secure them to the chassis. There are two shims from which to choose; one has 1½ degrees of anti-squat, while the other has 3 degrees. The 3-degree shims are recommended for initial set-up, but track conditions will eventually dictate how much anti-squat you need.

● **Rear shocks.** If you've ever built a competition-designed off-road car, the TRX-1's shocks will look familiar. During assembly, you must lubricate all the parts that seal with the oil that will be used in the shocks. This will prevent the O-rings (which form the seals) from being torn when you insert the shock shaft.

The TRX-1 kit includes a choice of shock pistons. As a starting point, I assembled the rear shocks with the one-hole pistons, and I filled them with Associated's 30WT 100-percent-pure silicone shock oil. This oil is guaranteed to

maintain its viscosity no matter what the temperature is—a desirable quality. The TRX-1 comes with only one set of rear springs ("blue" ones, although Traxxas offers other springs separately), so I installed them. They seem fairly firm and well-matched to the shock damping.

The instructions tell you to mount the rear shocks in the middle hole of the three on the graphite shock tower, and on the innermost hole on the A-arms. Of course, these are only suggestions, but the people who design the cars are usually the ones who write the instructions, so take their advice—at least, to start. I found that using the inner hole on the A-arm gave the car a little too much suspension travel: the drive shafts were at an extreme angle (one that was a little beyond their proper operating radius) so I mounted the shock in the middle hole.

## FRONT SUSPENSION

● **A-arm mounts.** As well as holding the A-arms on the chassis, the TRX-1 front mounts serve as a means to adjust caster. Just as with the rear A-arm mounts, Traxxas provides caster shims that can be installed between the mounts and the chassis to alter the degree of caster.

The front of the chassis is manufactured to have approximately 30 degrees of caster. This is ideal; you should only have to alter it when you've tried all other tuning methods. As with the rear, all the molded parts went

*(Continued on page 117)*



KYOSHO

# Honda NSR

by DAVID BLEISCH

IF YOU'RE looking for realistic Grand Prix-style two-wheelin' action, Kyosho has a motorcycle kit for you. The 1/8-scale Kyosho\* Honda NSR 500 racing bike looks, acts and handles like its full-scale counterpart, which took second place in the 1986 World Championship.

The most striking features of this model are its outstanding details. Its working chain-drive system delivers power from the gearbox to the sprocket on the rear wheel. A gyro-type steering system makes the bike stable and eliminates the need for training wheels. Additional details include front disk brakes, a working roller pin behind the front wheel and real rubber exhaust tubing that runs to the mufflers.

Kyosho has cleverly concealed many of the parts that distinguish an R/C model from a full-scale machine. The lower cowling can be snapped on and off easily to reveal the battery pack and the connectors and to provide access to the gearbox. The antenna slips into the rider's body, where it's hidden from view. The kit also has a set of finely detailed decals, including stripes that run along the paint lines so you don't have to worry if you've given the bike an uneven paint job.

Crash bars mounted on the bike's side protect the cowling

(and your paint job) from scratches and more significant damage when the bike takes a spill. The crash bars keep the bike sufficiently upright when it's not moving, and they allow you to start the bike without hand-launching it. If you apply throttle as you turn the front wheel toward the side to which the bike is leaning and you gradually increase the radius of the resultant spin, the bike will eventually stand up-

right. The maneuver is a little tricky, but it beats chasing the bike every time it goes down.

## ASSEMBLY

All the bike's parts fit together flawlessly; the only trimming that's necessary is the removal of the "runners" that hold the plastic pieces together. Although the pieces for the rider don't fit together quite as well as the others, you can fill the gaps between them with all-

The most striking features of this model are its outstanding details.



## TWO-WHEEL TERROR

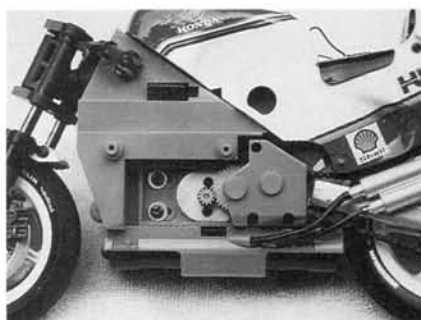




purpose glue. The seams aren't noticeable after you've painted them.

The instruction manual describes the 40 assembly steps using 20 exploded-view drawings that include diagrams and descriptions of the small parts needed for each step. Although the manual is short on written instructions, the detailed drawings should provide sufficient guidance even for inexperienced model builders.

● **Gearbox.** The kit comes with pinion gears of three sizes—10, 12 and 14 teeth. The holes that have been drilled in the gearbox for the motor mount are for use with the 10-tooth pinion gear. To use either of the other two pinion gears, you'll have to elongate the motor mount holes into ovals. The instructions recommend that you use a small round file to do this, but gently scraping the sides of the holes with a sharp model knife will also work nicely. Perhaps Kyosho should have made the holes oval in the first place, particularly because most modelers probably



*With the NSR's undercowling removed, you can see the simple, effective drive train. The LeMans DM20 motor (included) is bolted to a sliding motor-mounting plate so that you can use pinion gears of different sizes.*

won't use the 10-tooth pinion gear unless they're driving on complex courses.

● **Steering head and steering servo.** Because the servo will eventually be mounted on both sides of the frame with wide pieces of servo-mounting tape, the frame is difficult to disassemble if you need to make adjustments. It's therefore important to position the steering pin accurately in the servo-saver and to adjust it properly the first time. Set up the steering mechanism to provide the front wheel with approximately 18mm of swing in each direction. Unless you have servo endpoint adjustments on your transmitter, you'll have to adjust the degree of swing by using the alignment of the servo horn in the servo-saver. Needless to say, both the transmitter and the receiver should be connected and turned on while you make these adjustments.

● **Radio system.** I use the Kyosho Impulse II RS-M set. It was designed specifically for Kyosho's motorcycle kits and, as you might expect, it fits the frame very well. The set includes a single-unit receiver/electronic speed controller and a miniature steering servo.

The only installation problem that I encountered was that the wire between the receiver and the servo was too short. I pulled it, and it did span the distance, but if it were about 1/2 inch longer, the installation would be easier.

● **Swing arm.** This connects the rear wheel and the sprocket to the frame. Before you go any further, sort out the various swing-arm pins, kingpins, roller pins and shock pins. They all come in the same bag, but you can identify them by comparing their lengths to the lengths of the pins shown on the parts diagram that's printed toward the back of the instruction manual. Many of the pins are of a similar size and length, so it's easy to use the wrong one. That's a mistake that, once discovered, may require a good deal of disassembly to correct (trust me on this one).



*Scale realism is evident in all the NSR's components. The bike's tires, brake rotors and front forks emulate those of the full-scale two-wheeler.*

Before you assemble the frame, check what you've assembled so far. The frame's two sides are held together by five easy-to-remove self-tapping screws and by foam tape on the servo. When the frame has been assembled, it



*Power from the motor is carried to the rear tire by this miniature chain-and-sprocket combination. The author painted the sprocket to appear as if it were made of metal—just like the one on the full-size bike.*



**When it's moving at higher speeds,  
the bike is extremely stable because a metal flywheel  
inside the front tire acts as a gyro to keep it upright.**

creates a fully enclosed case that, when combined with the frame cover, keeps dust, dirt and moisture away from the receiver, motor and gears. The frame cover can be removed easily to provide access to the gearbox for lubricating and adjusting the drive-train tension.

Before you assemble the rest of the kit, paint what you're going to paint (except the rider; paint him only after he has been assembled), and apply the decals. Unlike most *car* kits, in which the only part that requires painting is

hardware stores, electronics stores and, yes, even hobby stores, without finding one. I finally resorted to using pliers to turn the nuts—cumbersome, at best.

## PERFORMANCE

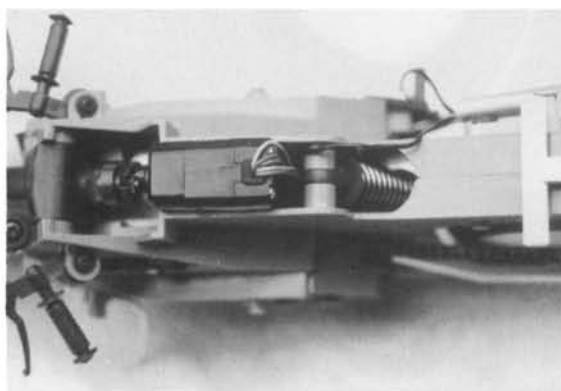
Do the words "lightning fast" mean anything to you? They do to me, too, but they don't describe this bike's performance. The included Le Mans DM20 motor, although it produces some respectable rpm for its size and power requirements, will *not* blow your socks off. The bike uses a 270mAh 6-cell flat battery pack that looks like a miniature 1200mAh pack.

Each pinion gear alters the bike's performance to suit a variety of track conditions. Of the three, the 10-tooth pinion gear provides the quickest acceleration and braking, the longest run on a charge (approximately 10 minutes) and the slowest top-end speed. The 14-tooth pinion gear provides the

slowest acceleration and braking, the shortest run (approximately 6 minutes) and the fastest top-end speed. Since the 10-tooth pinion gear provides the most maneuverability and the quickest acceleration, it's the best choice for small courses with complex or multiple curves. The 14-tooth pinion gear is best suited to courses with long straight-aways and large oval tracks where top-end speed is more important than acceleration. The acceleration, braking, run time and top-end speed provided by the 12-tooth pinion gear falls between those of the 10- and 14-tooth pinion gears.

Because the bike has only two

*(Continued on page 138)*



**Kyosho's Impulse II RS-M radio system contains this innovative mini-receiver/electronic speed controller combination. It makes excellent use of limited space.**

the easy-to-remove Lexan body, several parts of the bike must be painted for it to look authentic. This includes the disk plates and the sprocket, which are virtually impossible to paint properly once the bike has been fully assembled. Avoid getting paint between the sprocket teeth or the chain will bind against it.

Assembling the wheel, the suspension and the cowling was easy to do and enjoyable. My only recommendation for improvement is that Kyosho include a molded-plastic nut driver for turning the 3mm nylon nuts on the axles, particularly since the necessary 5.5mm nut driver is difficult to find (at least in my neighborhood). I checked with quite a few

## HONDA NSR 500

Type ..... Racing bike  
Scale ..... 1/8-scale  
Price ..... \$114.95

### DIMENSIONS:

Overall Length ..... 10.1 inches  
Width ..... 2.6 inches  
Wheelbase ..... 7.2 inches

### WEIGHT:

Gross (with battery) ..... 24 ounces

### BODY:

Type ..... Honda NSR 500  
Material ..... Plastic

### FRAME:

Type ..... Enclosed, molded frame  
Material ..... Fiberglass-reinforced ABS

### DRIVE TRAIN:

Primary ..... Pinion/spur  
Secondary ..... Chain/sprocket  
Bushings ..... Plastic

### SUSPENSION:

Front: Type ..... Dual side mounts  
Damping ..... Internal-spring tube shocks  
Rear: Type ..... Swing arm  
Damping ..... Coil-over friction shock

### WHEELS:

Front: Type ..... Nylon w/metal flywheel  
Rear: Type ..... Nylon

### TIRES:

Front/Rear ..... Rubber racing slicks

### ELECTRICS:

Motor ..... LeMans DM20  
Battery ..... 7.2V 270mAh  
Speed Controller ..... Not included

**OPTIONS AS TESTED:** Kyosho Impulse II RS-M set, which includes a combined receiver/electronic speed controller and mini steering servo.

**COMMENTS:** gyro-type steering and an authentic chain-drive system contribute to the Kyosho Honda NSR 500's realistic appearance and performance. The NSR is definitely more show than go, and its top-end speed may be disappointing to those used to driving 1/10-scale cars and buggies. Its stability and maneuverability are very good, so there's no need for training wheels. The bike is also available in a Yamaha YZR 500 model.

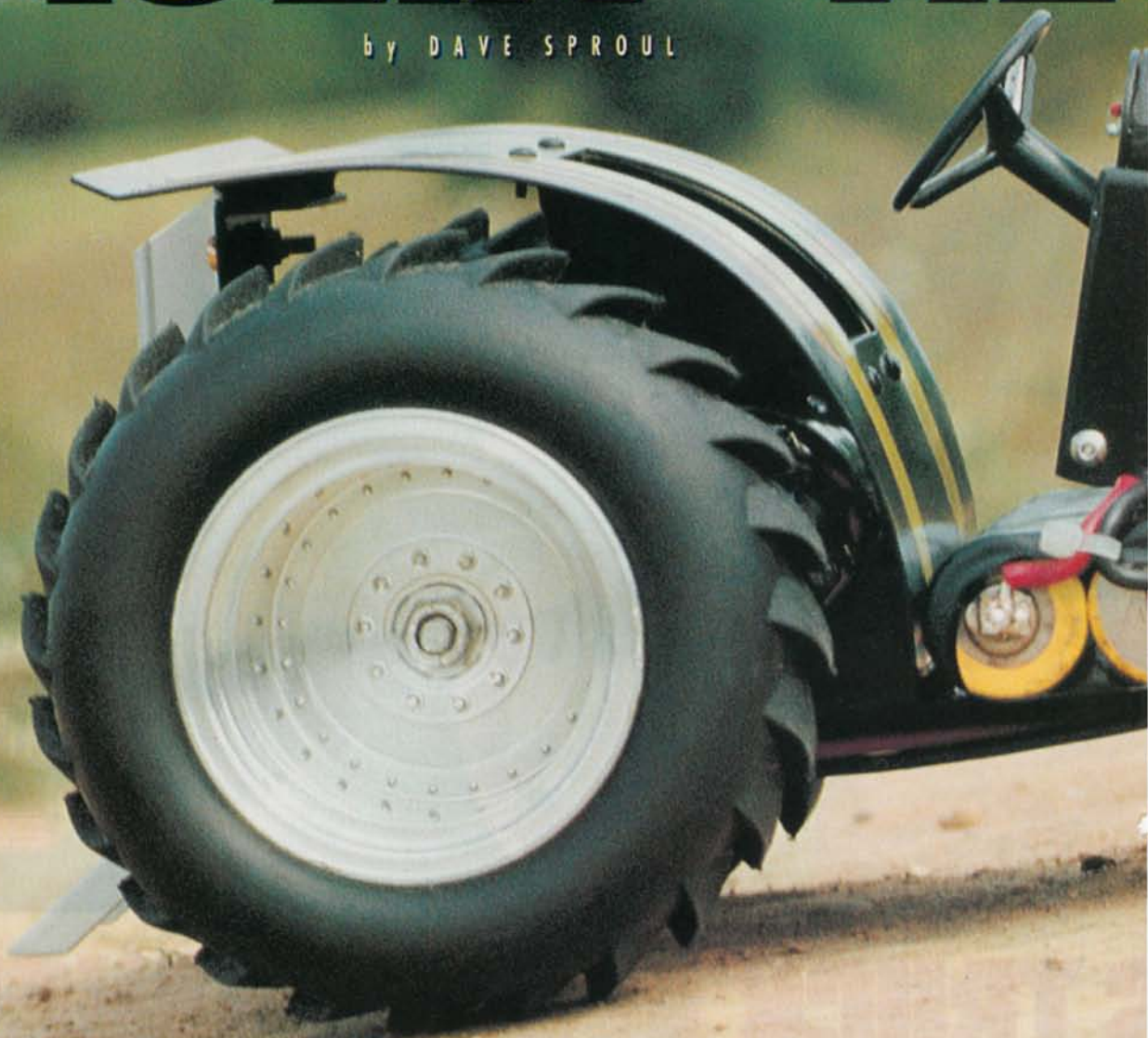






# HAULIN' HE

by DAVE SPROUL



**T**RUCK AND TRACTOR pulling machines can assume many forms, from stock 8hp garden tractors to the multi-engined monsters that you've seen on ESPN and at arenas across

the country. One exciting class that's rarely seen on television is the mini-rods. For many years, 8hp to 9hp garden tractors have been used in pulling competitions at local fairs, so it was only a matter of

time before someone modified a garden tractor by installing a more powerful engine. The resulting V8-powered mini-rods have evolved into high-powered bucking broncos. Two divisions of mini-



# MI



## MOPAR MUDSLINGER

PHOTOS BY DAVE SPROUL

rods exist: the small-tire class, which is limited to normally aspirated (no blowers), small-block V8s; and the large-tire class, which permit big blocks, blowers and alcohol





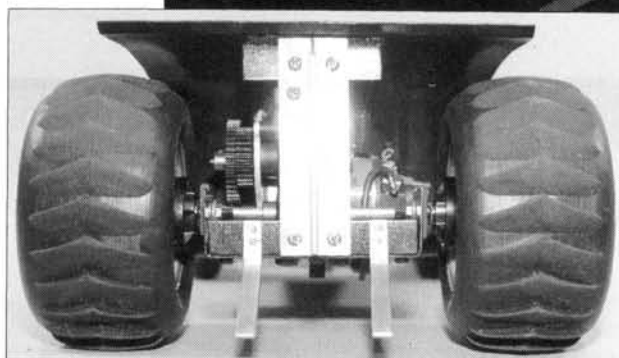
fuel. Both types of tractor are assembled on custom-built frames and use various car, truck and/or tractor components. Owing to their light weight, short wheelbase and awesome power, these "pocket rockets" bounce, dance and sway down the pulling tracks as if they were possessed. They might not produce the thundering roar of the larger machines, but they're definitely not boring to watch!

The Haulin' Hemi pictured here is a 1/10-scale attempt to capture some of that mini-rod excitement. (I decided to build this model after I saw similar R/C machines that two guys in Indiana had built.) R/C mini-rods look great and they're very realistic on the track. I had this nicely detailed Parma Hemi\* engine that needed a home...well, you get the picture. The creative juices started flowing, metal shavings started to fly, and, when the dust had settled, the Hemi had a new home!

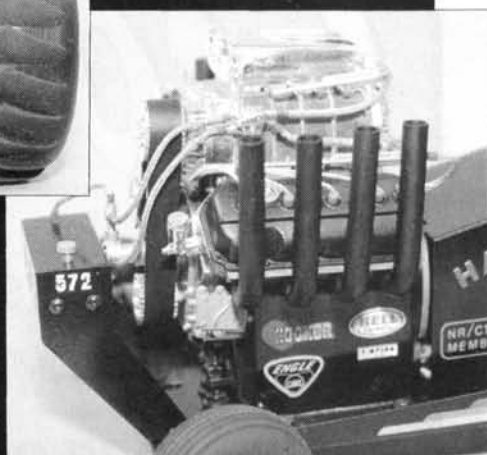
The chassis consists of a simple, hand-formed aluminum front axle with Associated\* steering knuckles from my parts box. I attached Du-Bro\* 1 3/4-inch model-airplane tires to the knuckles; in the rear, I fitted a Kyosho\* Ultima gearbox with a handmade solid axle that rides on ball bearings. It's powered by a Kyosho Mega Monster 360R, and it's "fueled" by a Fine Design\* Firefox 8-cell 4/5 sub-C battery pack. It's controlled by a Duratrax\* DTX-4 speed controller, and it holds the ground with chrome Blackfoot replacement rims fitted with TMS\* tires. In the rear, handmade wheelie bars prevent wild "wheel stands" and nasty rollovers. I ordered the engine details from MSC Model Products\*.

The body panels are all hand-formed sheet aluminum covered with black enamel paint. The

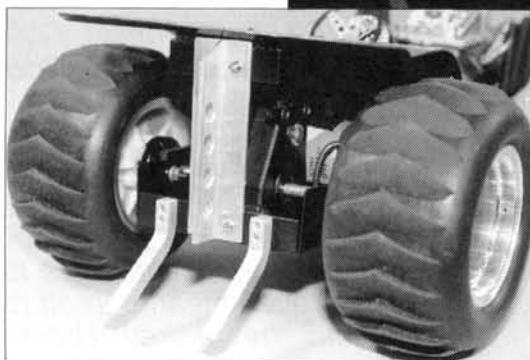
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Above: notice that there's no rear suspension. The axle is a straight piece of steel rod.



Right: the Parma Hemi engine adds a realistic touch to any vehicle. The author made the exhaust headers out of Plastruct tubing.



Above: the rear of the Haulin' Hemi is equipped with a trailer hitch and a pair of aluminum wheelie bars.

## HAULIN' HEMI

### DIMENSIONS:

Overall Length ..... 13.5 inches  
Width ..... 8.5 inches  
Wheelbase ..... 9.5 inches

### WEIGHT:

Gross (with battery) ..... 3.5 pounds

### BODY:

Type ..... Hand-formed  
Material ..... Aluminum Sheet

### FRAME:

Type ..... Hand-formed  
Material ..... Aluminum sheet

### DRIVE TRAIN:

Primary ..... Pinion gear/spur gear  
Secondary ..... Kyosho gear reduction transmission  
Bearings ..... Ball bearings

### SUSPENSION:

Front: Type ..... Hand-framed aluminum axle  
with Associated steering knuckles  
Rear: Type ..... Ball-bearing-supported,  
one piece axle

### WHEELS:

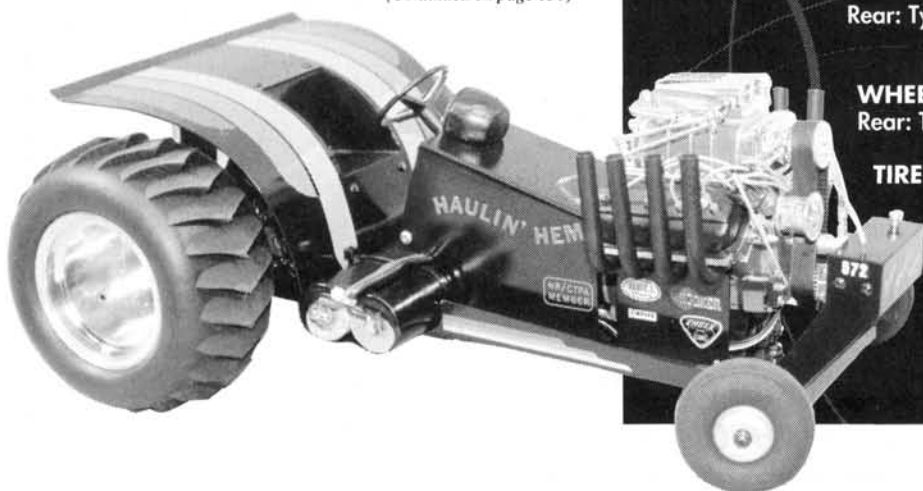
Rear: Type ..... Blackfoot

### TIRES:

Front/Rear ... Du-Bro model airplane/TMS

### ELECTRICS:

Motor ..... Kyosho Mega Monster 360R  
Battery ..... Fine Design Firefox 8-cell  
Speed Controller ..... DuraTrax DTX-4





by LARRY COLE

**I** WAS READY! After completely wiping out the field at my local indoor track during the heats, confidence flowed from my every pore that the A-Main would be mine. With a smugness that's born of sheer stupidity, I labored in the pits to ensure that nothing could or would go wrong: take the motor out and clean it, and clean the bearings; look for loose nuts and bolts; check the tires. Ah-ha! The tires! They must be at least three weeks old, and

#### TAKE A BITE OUT OF YOUR TIRES!

everyone knows that new tires are better than old ones. Off to the parts counter I went. I plunked down my money for a new set of rears and went back to the car. As I changed the tires, I secretly patted myself on the back for being so clever.

As I set my car down on the track for the A-Main, I knew this race was mine. Like I said, I was *ready*! The horn blew, and off we went! I was given the holeshot by two other cars, but with all the confidence of Casey after his first two strikes, I shrugged it off, knowing that the battle was still mine to win.

But wait, something was amiss! I charged into the first turn—aruggghh! The car pushed up to the wall, and it was only by slowing way down that I was able to keep the car off it! “Sabotage!” my



*The Cobra Trackside Tire Truer can accurately cut most mounted foam tires in seconds.*

T R A C K S I D E

# Tire Truer

brain screamed out, “They vacuumed the track, or put oil in my groove, or something!” As I came off the second turn, panic set in. I tried to accelerate off the second turn and...did I say accelerate?—*Lug* off the second turn is more like it. When I reached the third turn, it was push time again. For the next four minutes, I did everything I could possibly do to get that car around the track. It was hopeless. Severely beaten, with my car in hand, I walked back to the pit area. What happened?

#### TIRE TROUBLES

To many of you, the answer is obvious—it should have been

to me. After racing a full-size oval-course car for close to 20 years, I should have known better. For those of you just starting, let me tell you what went wrong.

When I replaced the rear tires, which were worn after three weeks of racing, I changed the car's handling and its gearing. When you run foam tires for a long time, their surfaces become slightly “glazed” and won't adhere to the track surface very well. The new, taller tires had more “bite” than my old, worn tires, and this caused the car to push. They also caused the gearing to change; I might just as well have used a bigger pinion. (The larger diameter of the

new tires would require the use of a smaller pinion gear to prevent the car from being sluggish out of turns).

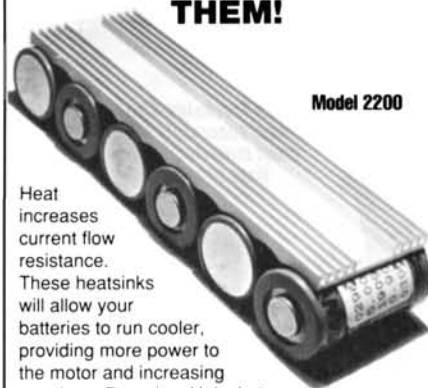
So—what to do? You can't use the same tires all the time, because, as the tire gets smaller, the reverse process will happen. What you can do, though, is get the Cobra\* Trackside Truer.

#### WHAT IT IS

The Trackside Truer is designed for racers: it's compact, yet durable. It comes partially assembled and you don't need an interpreter to translate the instructions. It also comes with a motor and two adapters—one for front tires and one for rear tires.

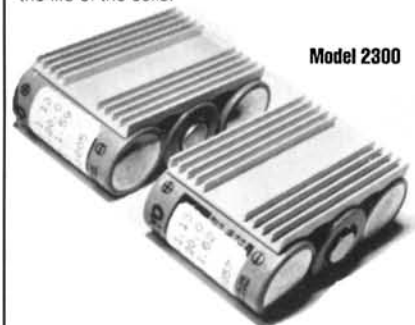


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Model 2300

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- ★ Model 2300 fits six cell saddle packs.
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- ★ Black anodized heatsinks weigh just one-half ounce.
- ★ Model 2200 and 2300 retail for \$16.95.

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## TIRE TRUER

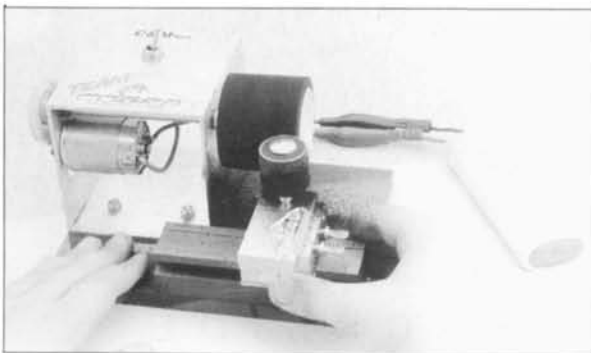
(Continued from page 49)

The unit is powered by a 6-cell pack (not included). You can pick up adapters that enable the Trueside Truer to work on 1/12-scale, Dominator, RC10 and Corally wheels.

Using this truer is a snap. Choose the right adapter (front or rear), mount the tire on the machine and then adjust the cutting block to the proper depth. (A few words of caution: I highly recommend that

take less off on each pass, and move the sanding drum much more slowly. Also, make sure that the battery pack is strong.

Here are a few more words of warning: the Truer makes a mess! You're cutting a tire, and the cut material has to go *somewhere*! I've seen many a track owner turn green at the sight of the truer. The trick is to use your head. I carry my truer



*To true a tire, simply attach it to one of the adapters, hook up a 6-cell battery and run the sanding drum across the tire!*

you wear safety glasses when you operate this machine, because tire particles will fly back at you! Also, don't try to cut too much at once; the machine will bog down, and the tire will become distorted.) At the flip of a switch, the tire starts to rotate. Slide the sanding drum against it, and work your way across its face slowly. I recommend that you measure the tire after each pass using calipers or by running a tape measure around its circumference. I also round off the tire's square edge by holding a flat file against its inside and outside edges while it's turning.

I've had problems using the Truer on "black dot" or other compounds that contain real rubber. On these tires, it's best to

in a large box, and when I cut tires at the track, I put the box on its side with the Truer inside it. This way, the tire pieces fall into the box, and not all over the counter or the floor. After a quick trip to the wastebasket when I've finished, the scene is as neat as it was before I started. This type of consideration is appreciated by track owners, and that can only help you in the future.

The Truer makes a lot of noise. It has 32-pitch gears and bushings, and the noise level can really get to you at times. I've found that using 64-pitch gears seems to help, and a little oil also goes a long way toward reducing the volume.

### HANDLING HINT

Anything you can do to keep your tires' diameter

consistent is an asset. Measure your tires when your car is performing at its best; when their performance starts to fade, use the Truer to dial a brand-new set to your measurements.

Your car isn't handling well to begin with? Why not use the Trueside Truer to stagger your tires (make the inside set of tires smaller than the outside—an oval-racers' trick)? Maybe you need more speed in the corners, or maybe those trued tires you've just purchased aren't *really* true.

I take new tires down 1/8 inch, which accomplishes two things: it trues up a tire that may not really be true, and it reduces sidewall flex when the car goes into a corner, thereby increasing corner speed. Keep in mind that the flatter the track, the more stagger you use—high banks, low stagger. Also remember that a little goes a long way. For example, 1/8 inch of stagger on a 1/10-scale car is equal to 1 1/4 inches stagger on a full-size car.

The Cobra Trueside Truer is, by far, the best investment I've made for my on-road car. Its price is offset by the money that I save on tires; instead of buying new ones, I just retrue them when they've become chunked or coned. It's portable, light and easy to use, and what it does for a car's performance is extraordinary! It could be what unites you with the A-Main and that elusive victory!

*\*Here's the address of the company that's featured in this article:*

**C&M/Team Cobra**, P.O. Box 701353, West Valley City, UT 84170. ■







TRACK REPORT

*Top-line*

# Lazer

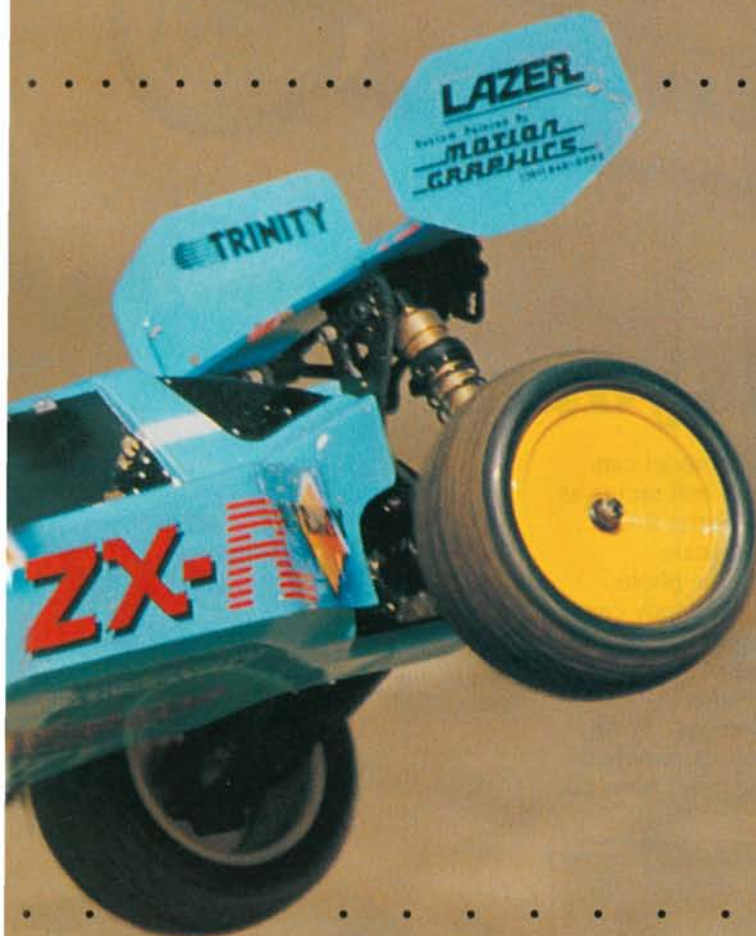
K Y O S H O



ARTICLE AND PHOTOS by JOHN HUBER



# Thrasher!



OVER THE PAST few years, I've had quite a few R/C cars, but until recently, I had never tried 4WD off-road electrics. To me, they always seemed to need lots of after-market parts (money) just to handle, and they required lots of maintenance to keep them in proper racing form. Sure, I drove one of my friends' cars for a few laps here and there, and I was impressed by the way it handled, but I never went out and bought one. Then Kyosho's\* new Lazer ZX-R arrived at the office. Well, as you can see, I snagged that puppy right away! After talking with some people who already had Lasers, I thought this new ZX-R had all the "good stuff" right out of the box.



# ZX-R



# LAZER ZX-R

## THE KIT

The kit we received was from Japan, so the chassis was fiberglass; we were told that the chassis offered in the USA will be graphite. The fiberglass didn't bother me much because the chassis is double-decked with a new, one-piece upper brace. The car's other new features include:

- **Most important: ball differentials.** (The Lazer ZX came with gear differentials, which most racers replaced with a set of ball units.)

- **A one-way front drive setup and a slipper clutch.**

The drive system allows the front tires to free-wheel when not under power, and it delivers full-time power to the rear. (Again, most drivers prefer this type of system to the center differential on the Lazer ZX.) The slipper is identical to the one on Kyosho's Triumph, and it allows you to adjust the amount of power that goes to the wheels.

- **New long front shocks.** These shocks improve handling by increasing front-end travel. The front and rear shocks have new tapered pistons for smoother action.

- **A set of graphite shock towers.** (After several crashes, the ZX's aluminum shock towers would be badly bent. They could be straightened, but this would weaken them.)

- **New 100-tooth, 48-pitch spur gear.** (This allowed me to use Hyperdrive's\* 48-pitch Aluma-lite pinion gear.)

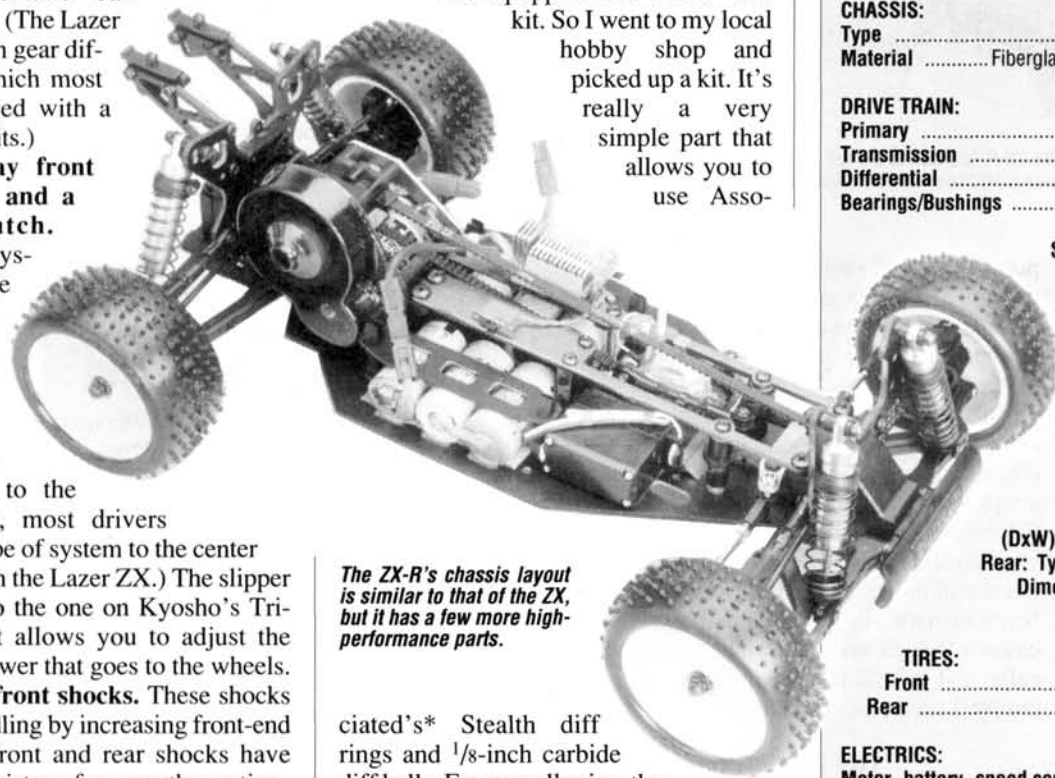
- **A full set of 2.2-inch dish wheels with W-5631 and W-5641 I-pattern tires.**

## ASSEMBLY

I had a little trouble assembling the ZX-R. It wasn't because it was difficult or that the instructions were bad: I just didn't have instructions! When the kit arrived, English instructions weren't available. I was able to build 90 percent of the car without them, but I was a bit unsure about the set-up of the slipper

clutch and the one-way gear. I received a set of instructions a couple of weeks later and found that I was pretty close, but I had put a shim in the wrong place. No biggie: I had the car ready in minutes.

When I compared the diff operation with that of Frank Masi's "Project Lazer" car, I was disappointed. It was smooth, but not nearly as smooth as his, which was equipped with MK's\* diff kit. So I went to my local hobby shop and picked up a kit. It's really a very simple part that allows you to use Asso-



*The ZX-R's chassis layout is similar to that of the ZX, but it has a few more high-performance parts.*

ciated's\* Stealth diff rings and 1/8-inch carbide diff balls. For a small price, the MK diff kit makes a world of difference.

I added two other products to the ZX-R. The two-piece stock motor plate is thick and rather heavy. I replaced it with a finned, red-anodized aluminum plate from GPM\*. It's much lighter than the stock plate, and it's one piece. To go with the cool-looking red motor plate, I had to get GPM's two-piece upper chassis brace. It, too, is red-anodized aluminum, but it's a little heavier than the stock one. At first, this didn't bother me, but because it's a two-piece part, I noticed some chassis flexing. I think the one-piece upper chassis plate would work better.

The battery-securing system in the ZX-R is slightly different from the one in the ZX. Instead of using clips to hold the battery plates across the cells, it has new

Type ..... Off-road  
Scale ..... 1/10  
Sug. Retail Price ..... \$399.95

### DIMENSIONS:

Overall Length ..... 14.25 inches  
Width ..... 9.5 inches  
Wheelbase ..... 11 inches  
Track (f/r) ..... 8.13 inches

### WEIGHT:

Gross (with battery) ..... 58.78 ounces

### BODY:

Type ..... Off-road  
Material ..... Polycarbonate

### CHASSIS:

Type ..... Dual-plate  
Material ..... Fiberglass (Japanese version)

### DRIVE TRAIN:

Primary ..... Pinion/spur  
Transmission ..... Belt  
Differential ..... Ball  
Bearings/Bushings ..... Ball bearings

### SUSPENSION:

Type (f/r) ... Lower  
A-arm with upper control link  
Damping (f/r) ... Oil-filled, coil-over shocks

### WHEELS:

Front: Type .. Plastic dish

### Dimensions

(DxW) ..... 2.22x1 inches  
Rear: Type ..... Plastic dish  
Dimensions (DxW) ..... 2.22x1.25 inches

### TIRES:

Front ..... Mini-spike  
Rear ..... Mini-spike

### ELECTRICS:

Motor, battery, speed controller .. Not included

### OPTIONS AS TESTED:

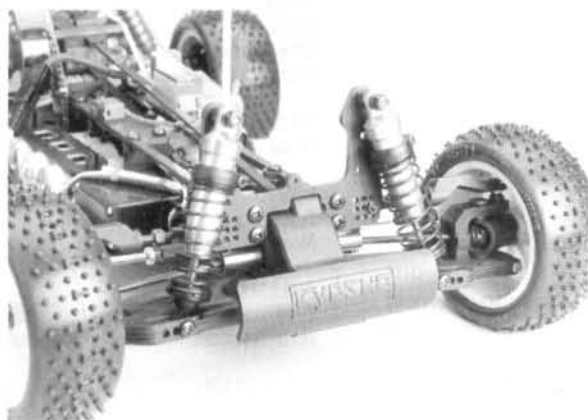
Trinity 12-turn triple motor and matched 6-cell Panasonic P-170 saddle pack; Futaba PCM radio; KO Propo PS1001 FET servo; Tekin 411P ESC; GPM lightweight motor plate and upper chassis plates; MK Engineering diff upgrade; Lunsford titanium turnbuckles; Robinson\* titanium ball ends; RPM ball cups; Hyperdrive Aluma-lite pinion gear; Dan's Grip Strips (to pad the saddle pack) and Dan's saddle-pack straps (to hold the cells in the car).

### COMMENTS:

Assembling the Lazer ZX-R was quite easy. I did hardly any work to fit the parts together. I'd like to see a few more spare parts included in the kit. For instance, only one 8mm washer was included, and there were a few places in which I could have used them to eliminate play. I replaced the steering linkage with Lunsford turnbuckles and RPM ball cups because the stock linkage limited suspension travel. To save weight, I replaced the stock motor plate with the GPM plate, and I installed the matching GPM upper chassis plates. All in all, the ZX-R is very well-designed.



# LAZER ZX-R

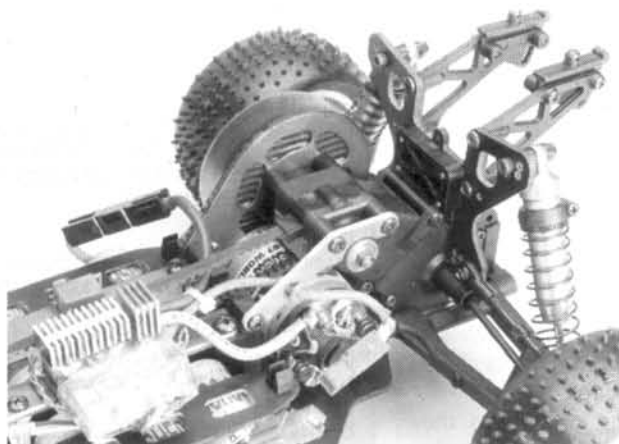


*Up front, the ZX-R has new 3.5-inch shocks with tapered pistons. They increase front travel while making the suspension smoother.*

posts that snap onto the plates. Although none of the packs came loose while I was racing, I did find the system rather awkward; I opted instead to use Dan's\* new nylon battery straps, which have a small plastic buckle and hold the batteries tightly. If you want to install the straps, cut slots in the chassis in front of and behind the cells; the straps will hold the packs securely in place. (There's a loop on one end of each strap; you can slide a small Allen wrench through it and pull the straps tight.) I like this system better than the one included with the kit because it's light and adjustable. To pad the cells, and to help hold them even more securely, I used pieces of Dan's Grip Strips.

## THE POWER

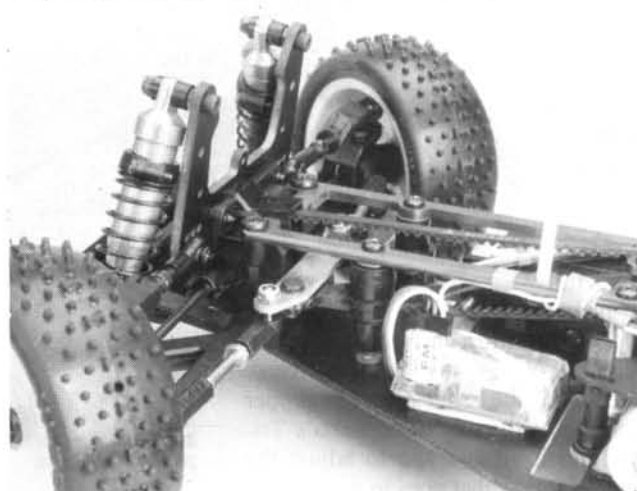
I went a little crazy in this department! I used a Futaba\* PCM radio with a Tekin\*



*The ZX-R's power comes from Trinity's Speed Metal 12-turn triple motor. Notice the great machining work on the GPM heat-sink motor mount.*

411P speed controller; and a good friend of mine, John Lee, from Queens Off-Roaders, managed to find the most awesome servo I've ever seen. After I had written the "Servo Roundup" article in the November '91 *R/C Racer*, I thought I'd seen it all; but then I saw the KO\* PS-1001 FET! To keep it small, this servo has an internal FET booster, and—get this—.07 second/60 degrees with over 100 ounce/inches of torque!

I was impressed by how well the new Lazers ran at the Worlds in Detroit last year, so I called Trinity to see what kind of motor and batteries they used. Well, much to my surprise, Ernie Provetti sent me *the* motor



*I used the stock steering system for this kit, but I installed four ball bearings instead of bushings. Notice also that I replaced the linkage with RPM\* ball cups and Lunsford\* titanium turnbuckles. This setup didn't bind as much as the stock linkage did.*

and batteries that Jack Johnson used to make the fastest lap time and to win 3rd overall! The motor is Trinity's\* new Speed Metal 12-turn triple, which uses three gauges of wire. The batteries are Panasonic P170s, and they were so choice that he insisted I return them. (I did get to keep the motor, though.)

## FINISHING TOUCHES

I sent the body to Richard Muise of Motion Graphics\* to get a really wild paint job. As you can see from the photos, his work is as amazing as always. In my opinion, this body looks a thousand times better than the ZX's. It just has such nice lines, and it's sealed so well to the underpan.

*(Continued on page 161)*



# PRIME PARTS



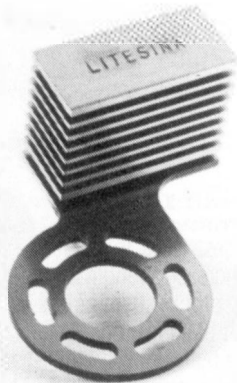
**Y**ou want to go faster, but with so many high-performance, after-market goodies out there, you simply don't know where to spend your hard-earned dollars.

Help has arrived! Car Action's editors have devised a list of what they think are the 25 most indispensable hop-up items. Each will help you to go faster—and that's

what we all want; right?

When they drew up this list, the editors considered all levels of R/C enthusiast. Some of these advantageous additions will suit those with modest budgets; others will probably break the bank. Either way, you won't find a more complete catalogue of riotous racing regalia!

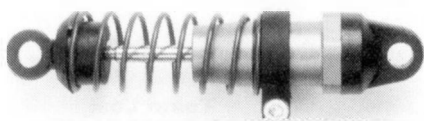
by FRANK MASI



## **Litespeed Litesink Heat-Sink Motor-Mounting Plates**

These aluminum motor-mounting plates are designed to fit most popular cars and trucks. They have larger surface-cooling areas that can keep your motors running cooler for much longer.

**1**



**2**

## **Associated Hard-Anodized Team Shocks**

These durable, high-performance shocks have hard-anodized, Teflon-coated shock bodies and a new design that enables you to insert the seals from the inside of the bodies. You can use them in off-road and on-road applications.



## **Trinity Motor Brushes**

Trinity's high-performance replacement motor brushes are just the ticket for squeezing extra horsepower out of stock or modified motors. Several types of brushes are available (including double- and single-shunted), and they're molded—not cut.

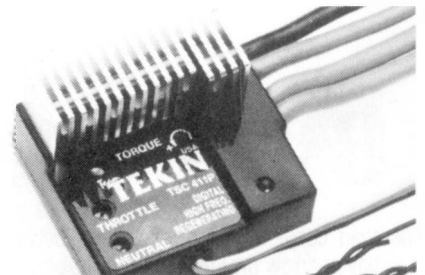
**3**



**4**

## **HPI Super Star Wheels**

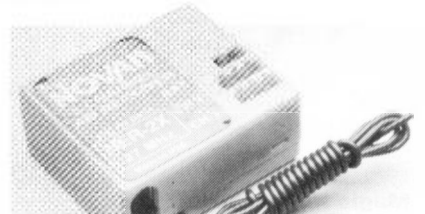
The best race cars are usually as light as possible. HPI's Super Star Wheels are light yet strong, and they're available for most popular off-road and on-road cars or trucks.



## **Tekin 411P High-Frequency Speed Controller**

The right speed controller is critical to your success, and the latest high-frequency ESCs offer precise throttle control and regenerative circuitry, which helps to prolong run times. The state-of-the-art Tekin 411P features adjustable torque control, dual-temperature sensors (to prevent overheating) and high-quality Megafet transistors.

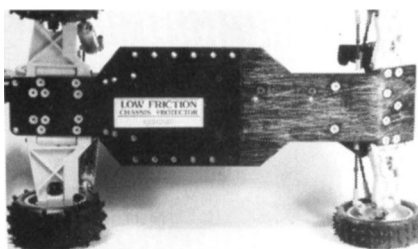
**5**



**6**

## **Novak Micro Receivers**

Light is right! Many racers replace the cumbersome receivers that often come with their radios with these high-quality units from Novak. The NER-2X is available on both 27MHz and 75MHz for AM systems, and the NER-3FM is designed for FM systems such as the Airtronics Caliber and the Futaba Magnum PCM (in the PPM mode).



#### Litespeed Tuff-Stuff

Litespeed's clear, self-adhesive Tuff-Stuff chassis protector prevents the bottom of your chassis from being scratched. It also reduces the friction that occurs when the chassis touches the surface of the track.

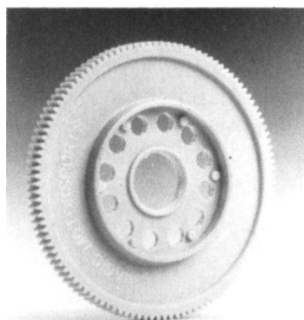
7



#### Du-Mor Star Force Pinion Gears

These precision-machined pinion gears are just the ticket for on-road and high-speed oval race cars! They operate with less friction than conventional pinion gears because they have narrow profiles, and they're beveled. Star Force pinions are even more efficient when you use them with thin, similarly beveled spur gears.

8



#### Magic Motorsports Pro Spur Gears

The Magic Motorsports Pro Spur Gears have molded-in shoulders that hold the diff rings and balls in place. Made of self-lubricating, composite-filled material for durability and reduced friction, they come in 48 and 64 pitch (distinguished by their fluorescent colors).

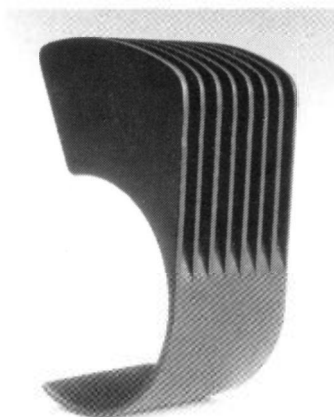
9



#### Airtronics 94151 and 94152 Servos

If you're looking for servos with super-fast transit times and loads of torque, then look no further than Airtronics' heavy hitters—the 94151 and 94152. The 151 features a 60-degree transit time of 0.08 second and 75 ounce/inches of torque. The 152 will travel 60 degrees in 0.12 second with a whopping 105 ounce/inches of torque.

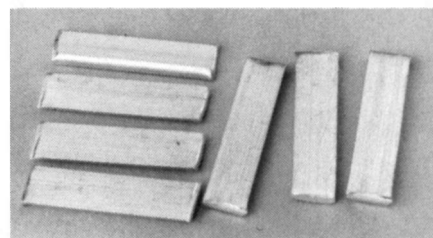
10



#### Holeshot Racing Motor Heat Sink

You can clip the innovative Holeshot motor heat sink directly onto the motor can. This provides a large surface-contact area that will distribute the heat evenly and increase cooling efficiency. For best results, allow as much air as possible to reach the heat sink.

11

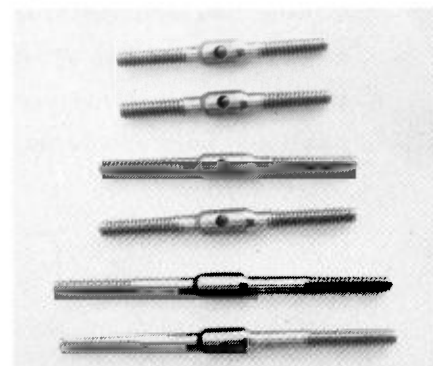


#### Max-Cell

#### Quicksilver Battery Bars

These 100-percent-pure silver pre-cut battery bars have less resistance than any on the market, and this makes them excellent for high-amp-draw racing.

12



#### Tecnacraft Titanium Turnbuckles

One of the best ways to reduce weight and increase strength is to replace the stock suspension linkages with titanium rods. Tecnacraft's turnbuckles have both right- and left-hand threads that make them easy to adjust. They're sold individually or in complete kits for specific cars.

13



#### Team Losi Lightweight Screws

Although they're packaged for Team Losi cars and trucks, you can use these high-quality, lightweight screws on all 1/12- or 1/10-scale on-road and off-road cars. The sets include 26 heat-treated, aircraft-aluminum-alloy flat-head and Allen-head cap screws. They weigh two thirds less than similar steel screws.

14

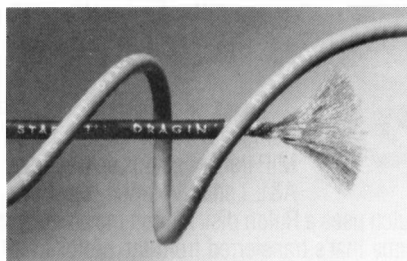




#### RPM Tie-Rod Ends

RPM Tie-Rod Ends make ideal replacements for stock ball cups. They stay on better and move more freely than most, and they have a little more "meat" into which you can thread tie-rods.

15



#### Stage III Silicone Covered Wire

Using a high-quality low-resistance wire is a must for serious racers. Stage III's wire has a lower resistance and a higher strand count than most types of wire. It's also made of the purest copper, and it's tinned to resist corrosion and to make soldering quick and easy.

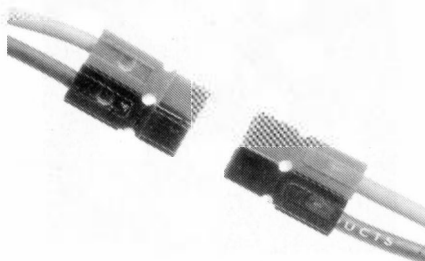
16



#### Ebert's Family Jewels

Here's a quiz for you: what are made of a harder material than standard diff balls, yet are one-third the weight and five times more concentric? The answer is Ebert's Family Jewels. These ceramic diff balls are guaranteed against breakage for one year, and they're available in 1/8-, 3/32- and 1/16-inch-diameter sizes.

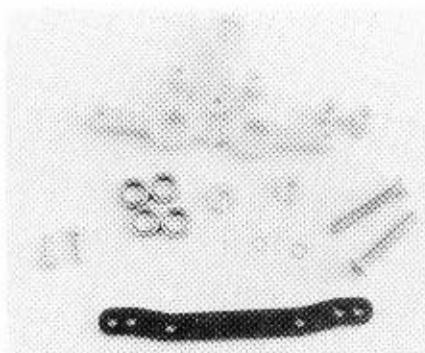
17



#### Litespeed Super Cons

High-quality motor and battery connectors are essential for good performance, and Litespeed's Super Cons are among the best in the industry. Their incredibly low resistance and reliability put them at the top of the connector heap.

18



#### A&L Ball-Bearing Steering Kit

Upgrading your car or truck with A&L's Ball-Bearing Steering Kit ensures that it will have precise, slop-free steering. The kit comes ready to install and it includes posts, a composite rack and molded, fluorescent bellcranks. It's available with or without bearings for most popular racing vehicles.

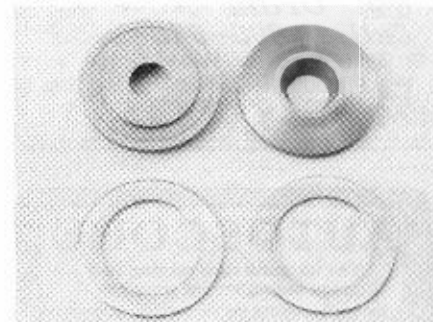
19



#### MIP Custom RC10 Gearbox

MIP's gearbox is ideal for competitive racing. This tranny has fewer moving parts than most, and it requires very little maintenance. The kit comes with precision bearings for low drag, a hardened-steel diff and outdrive assembly, brass gears and a glass-filled nylon casing.

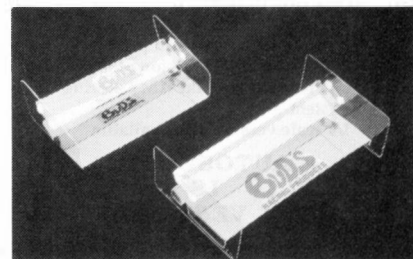
20



#### MK Diff Upgrades for Kyosho Cars

If you have a Kyosho off-road car that uses ball diffs, these new MK Engineering parts are a must for smooth operation. The set comes with machined-aluminum drive plates that are lighter than stock units and are designed for use with Associated Stealth diff rings (also included).

21



#### Bud's Racing Products Bi-Level Wing

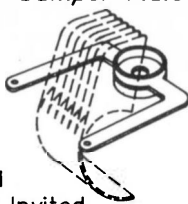
If you're a serious oval racer, you probably already know about Bud's Bi-Level wing. For the uninformed, this serious, aerodynamic device provides unparalleled downforce—keeping the rear of your car glued to the track on the straight-aways and through the turns. It's available in Mini, Super and Adjustable versions.

22

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## AUTOSCORE

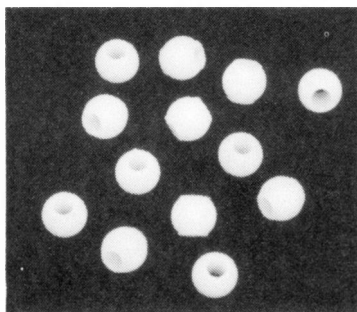
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### RPM Lightweight Hardware

Here's some more weight-saving  
stuff! Using RPM's lightweight  
hardware (including nylon nuts  
in 4-40, 6-32 and 8-32 sizes)  
and .250-inch-diameter Delrin pivot balls, will  
ensure that your car is as light as possible.

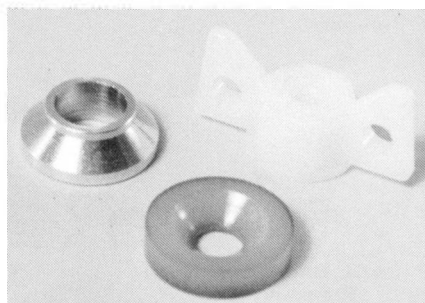
23



25

### A&L Power Clutch

Designed to fit all Team Losi and  
MIP transmissions as well as the  
A&L Lethal Weapon, the Power  
Clutch uses a Rulon disk to limit the amount of  
torque that's transferred from the motor to the  
tires, preventing unwanted wheel spin.



24

### Bud's Racing Products Diff Thrust Cone

If you want the diff in your pan  
car to operate smoothly, try  
Bud's Thrust Cone. It replaces  
the entire thrust-bearing assembly and, instead,  
uses the wheel's outboard support bearings by  
means of an aluminum cone and a plastic  
tension washer.

**A&L Mfg.**, P.O. Box 2115, Corona, CA 91718; (714) 735-5249.

**Airtronics Inc.**, 11 Autry, Irvine, CA 92718; (714) 830-8769.

**Associated Electrics**, 3585 Cadillac Ave., Costa Mesa, CA 92626;  
(714) 850-9342.

**Bud's Racing Products**, 1575 Lowell St., Elyria, OH 44035; (216)  
284-0270.

**Du-Mor R/C Inc.**, 1002 Union Landing Rd., Cinnaminson, NJ  
08077; (609) 829-1338.

**Eberts**; distributed by Max-Cell, P.O. Box 1211, Mt. Laurel, NJ  
08054; (609) 231-1863.

**HPI (Hobby Products International)**, 22600-C Lambert, Ste. 904,  
El Toro, CA 92630; (714) 837-3250.

**Litespeed Inc.**, P.O. Box 4765, Spokane, WA 99202; (509) 535-  
2717.

**Magic Motorsports**, 1901 E. Linden Ave. #8, Linden, NJ 07036;  
(908) 862-1705.

**Max-Cell**, P.O. Box 1211, Mt. Laurel, NJ 08054; (609) 231-1863.

**MIP (Moore's Ideal Products)**, 746 E. Edna Pl., Covina, CA  
91723; (818) 339-9007.

**MK Engineering**, P.O. Box 216, Seymour, CT 06483; (203) 888-  
5727.

**Novak Electronics Inc.**, 128-C East Dyer Rd., Santa Ana, CA  
92707; (714) 549-3741.

**RPM Custom Engineered R/C Products**, 14978 Sierra Bonita Ln.,  
Chino, CA 91710; (714) 393-0366.

**Stage III**, 1189 Chicago Rd., Troy, MI 48083; (313) 585-1150.

**Team Losi**, 13848 Magnolia Ave., Chino, CA 91710; (714) 465-  
9728.

**Tecnacraft**, 1335-B Dayton St., Salinas, CA 93901; (408) 422-  
7466.

**Tekin Electronics Inc.**, 970 Negocio, San Clemente, CA 92672;  
(714) 498-9518.

**Trinity Products Inc.**, 1901 E. Linden Ave. #8, Linden, NJ 07036;  
(908) 862-1705.





## TRACK REPORT

# HYP ER D



by STEVE POND

# HYP ER

**R**/C ON-ROAD race cars are simple by design. The surfaces on which they race are very flat (or at least smooth), and this negates the need for the complex suspension systems used by off-road R/C cars. Most on-road cars have flat, graphite chassis plates and simple front and rear suspensions. Although a few have profoundly different suspension designs, most cars are only separated by subtle

differences. These subtleties can often make or break a car's racing success.

Hyperdrive's\* newest on-road race cars, the H10SC and the H10SE, prove that details do make the difference between mediocre and marvelous. They may look similar to many other cars, but they have design features and details that put these cars among the very best.

You might remember that the original





PHOTOS BY STEVE POND

# RIVE

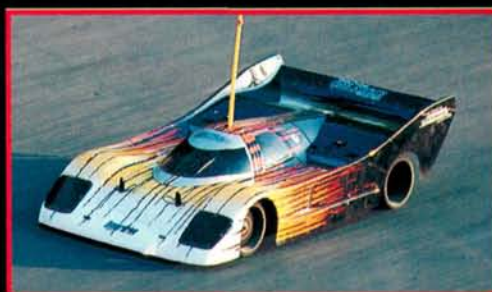
## Hyperspeed speedsters



# 10 CARS

*Hyper 10 made something of a splash when it was first introduced. Its wide front end and narrow rear end emulated those of full-scale race cars and went against the grain of old-school R/C design. This "backward" configuration was designed to improve steering by enabling these cars to use tires made of hard compounds, which reduce rolling resistance. The original Hyper 10 also had*

*battery trays and 6-cell stick packs that were mounted across the rear of its chassis instead of the usual saddle-style packs.*





## ADVANTAGES

The H10SC and H10SE fulfill the needs of a more diversified market. The wider H10SC is designed for on-road racing, and the narrow H10SE is designed for high-speed oval racing. Both retain many of the design features that made the original Hyper 10 a potent performer, e.g., a battery tray for stick-packs and the responsive three-shock rear suspension. (Except for the difference in their widths, the new cars are almost identical.) Each car has a graphite chassis plate with two upper supports that make the chassis extremely rigid. Their front suspensions are variations of the old crossbar axle. The axles are held to the chassis with aluminum cinch blocks.

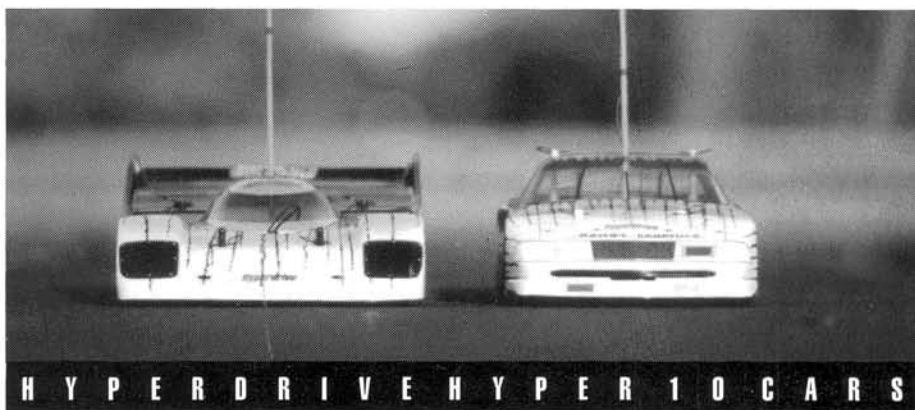
The Hyperdrive crossbar is unique because of its extra-long kingpins and its axle-mounted steering servo. The long kingpins have a section of fuel tubing above the suspension spring that softens the blow when the suspension bottoms out. Below the suspension springs are heavy-duty steering blocks identical to those used on the Associated RC10 off-road cars.

With the servo mounted on the axle, there's more room on the chassis for other electronics, and the servo can move with the axle when you make caster adjustments. After the steering linkage has been set, caster adjustments will have no effect on it.

Their rear suspension design is based on the age-old T-plate, but it offers a smoother, more consistent operation than that of any other on-road car. Instead of a flexible one-piece T-plate, the Hyperdrive cars use two-piece graphite T-plates.

The tongue of the T-plate is mounted on the chassis and supported by front and rear pivot balls. The balls allow the T-plate to roll from side to side with little resistance. For up-and-down movement, the lateral part of the T-plate is also supported by pivot balls—one to the left, and one to the right.

A one-piece, fiberglass T-plate flexes constantly; this causes fatigue in the T-plate, and results in a lack of consistency in the rear suspension. Because the two-piece T-plate doesn't flex, it causes very little resistance in the suspension, so to adjust the rear suspension, you adjust the shocks' spring tension. Instead of supplementing the suspension, the springs on the shocks in the Hyperdrive cars are the suspension.



The rear-shock configuration on the new cars is more durable. The tall shock tower used on the older cars served as a mount for all three shocks. The long upper shock was mounted from the rear of the pod to the top of the tower. If the car collided with something hard, the pod would fly forward and cause the shock to bottom out. When the shock couldn't absorb any more of the impact, all of the stress was transferred to the shock tower, which would eventually break away from the chassis. In the new configuration, the center shock is mounted from the front of the rear pod to a post in the center of the chassis, and the two side shocks are mounted to a shorter tower that's attached to the T-plate. This setup reduces the risk of damage and lowers the center of gravity slightly for better handling.

The cars' rear axles are similar to those found on other graphite and aluminum on-road cars, but they're designed to accept Hyperdrive drive rings. The rings are larger in diameter than others, and they've been sandblasted on one side to prevent them from slipping during acceleration.

The car also features light Delrin hubs, extra-strong wheels (on which you can use the included foam tires or any other compound), body mounting posts and a light, molded front bumper.

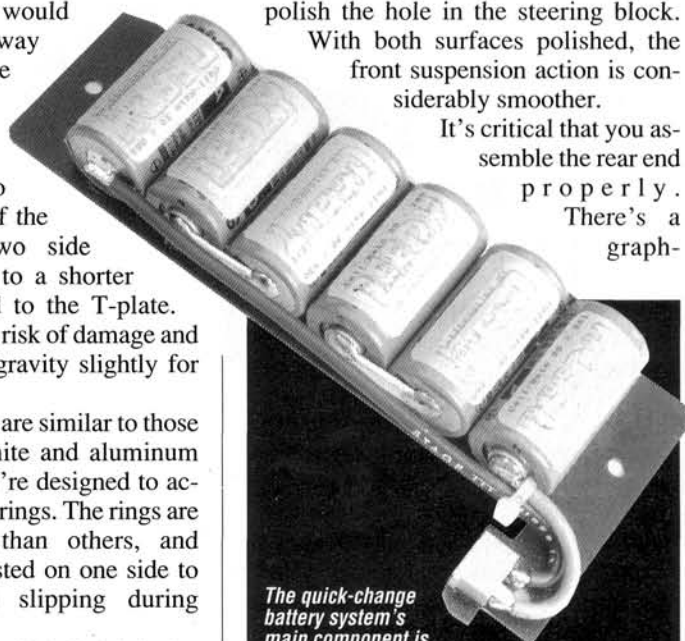
## SET UP FOR SUCCESS

Hyperdrive's clear, detailed assembly instructions should pose no problems to R/C enthusiasts who have some building experience. If you follow the instructions, the cars will perform very well, but there are a few things you can do to make assembly a little smoother and to improve the cars' handling characteristics. These pointers apply to both cars, except where noted.

These simple steps can transform the suspension from good to great. The kingpins and steering blocks have machined surfaces that can cause erratic operation, regardless of how well-lubricated they are. Before I pressed the kingpins into the axle, I put the axle in a Dremel\* Mototool and polished its surface with piece of crocus cloth (very fine-grit sandpaper for polishing). I also rolled up a piece of crocus cloth and placed it in the Mototool to polish the hole in the steering block.

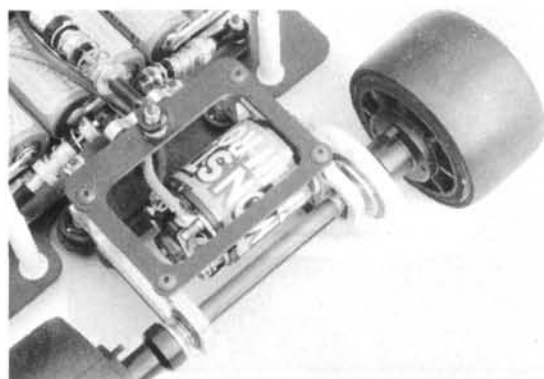
With both surfaces polished, the front suspension action is considerably smoother.

It's critical that you assemble the rear end properly. There's a graph-

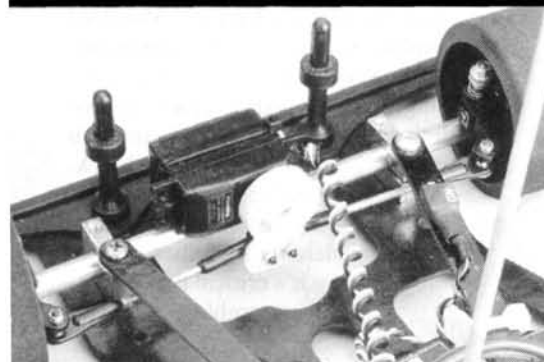


*The quick-change battery system's main component is this L-shaped graphite piece to which you attach the 6-cell battery. The female connector half is automatically aligned with its male counterpart that's mounted on the main chassis.*

ite plate that bridges the slot for the T-plate and provides a place on which to mount other rear-suspension components. I found it difficult to thread the nylon standoffs (they "sandwich" the plate) over the two 4-40 screws that hold the plate to the chassis. One solution is to drill holes in the standoff blocks. They should be just large enough to slide over the screws; any larger, and the plate won't be held firmly to the chassis and there will



Above: Lightweight Delrin hubs are standard equipment on these cars. I added TRC T/M radial tires, Robinson Racing's narrow-profile, 64-pitch spur gears and Hyperdrive's light pinion gears. Below: Despite its fairly conventional appearance, the H10 has an innovative front suspension. Its extra-long front kingpins allow room for rubber bumpers that absorb shock when the springs bottom out, and the servo pivots with the axle when you make caster adjustments.



## H10SC

H Y P E R D R I V E

**Manufacturer** .....Hyperdrive  
**Type** .....On-road  
**Scale** .....1/10  
**Price** .....\$449.95

### DIMENSIONS:

**Overall Length** .....18.75 inches  
**Width** .....8.875 inches  
**Wheelbase** .....10.25 inches  
**Front Track** .....7.25 inches  
**Rear Track** .....6.875 inches

### WEIGHT:

**Gross (with battery)** .....43 ounces

### BODY:

**Type** .....Andy's Lotec GTP\*  
**Material** .....Polycarbonate

### CHASSIS:

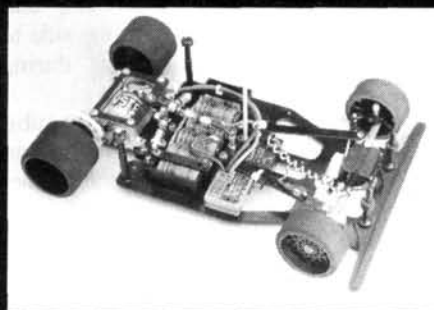
**Type** .....Plate  
**Material** .....Graphite

### DRIVE TRAIN:

**Primary** .....Pinion/spur  
**Transmission** .....None  
**Differential** .....Ball  
**Bearings/Bushings** .....Ball bearings

### SUSPENSION:

**Front: Type** .....Rigid beam/cinch block  
**Damping** .....Floating axle/coil spring  
**Rear: Type** .....Two-piece T-plate  
**Damping** .....Three oil-filled, coil-over shocks



### WHEELS:

**Front: Type** .....TRC BBS\*  
**Dimensions (DxW)** 1.95x1.125 inches  
**Rear: Type** .....TRC BBS\*  
**Dimensions (DxW)** ..1.95x2.0 inches

### TIRES:

**Front/Rear** .....Atlantic Gomme\*

ics or the accessories necessary to make it race-ready, so I shopped for some hardware. Both cars were equipped with Futaba\* PCM 1024 radios—systems appropriate for race cars of this caliber. In the H10SC, I installed an S132H steering servo; a Novak\* 410-M1c speed controller; Trinity\* matched Sanyo 1400 SCRs; a Trinity 16-turn Quad Tri-Rotor modified motor; Hyperdrive's new, light, aluminum pinion gear; Robinson Racing's\* narrow-profile, 64-pitch spur gear; custom-mounted Atlantic\* Gomme tires; and TRC\* composite BBS wheels.

I equipped the H10SE with an ultra-fast, ultra-powerful Airtronics\* 94151 servo. It's more than capable of handling the substantial loads placed on the steering during high-speed oval racing.

I used Novak's top-of-the-line 410-MXc speed controller. It's slightly heavier and larger than the M1c, but it's more efficient, and efficiency is everything in oval racing. Other accessories include Reedy\* matched Team Sanyo 1400 SCRs; a Trinity 13-turn, single-wind Tri-Rotor; Hyperdrive's light, aluminum pinion; Robinson's narrow-profile, 64-pitch

### ELECTRICS:

**Motor** .....05/540\*  
**Battery** .....6-cell sub-C\*  
**Speed Controller** .....Electronic\*

### OPTIONS AS TESTED:

Futaba Magnum PCM transmitter and S132H servo; Novak 410-M1c speed controller; Trinity matched 6-cell SCR 1400mAh battery and Tri-Rotor 16-turn quad motor; Hyperdrive light aluminum pinion gear; Robinson Racing narrow-profile, 64-pitch spur gear; TRC BBS wheels; and Atlantic Gomme tires; Bud's Racing stabilizer wing.

### COMMENTS:

The Hyperdrive H10SC is a serious road racer but, as with many top-of-the-line cars, performance has its price. The SC isn't exactly inexpensive, but you get a car that's second to none when it comes to performance, quality and adjustability.

\*not included



spur gear; and TRC T/M radials—the most popular capped tire in paved oval racing. I chose the gold compound, which seems to provide the best all-around traction for average track and weather conditions.

Richard Muise of Motion Graphics finished both cars. I supplied him with an Andy's\* Lotec GTP body for the H10SC, and an Associated\* narrow Lumina body for the H10SE. He gave both bodies the paint scheme from the Chevy Cyclone prototype mini pick-up—a scheme I first used on the Project Yokomo, which was featured in the July '91 issue. Since then, I've adopted this brilliant scheme for all of my race cars.

Testing the Hyperdrive cars produced no surprises. It's not that the cars didn't perform well, it's just that I had a gut feeling while I was building them that they would be excellent performers. In its element and properly tuned, each car can match or exceed the performance of any other car on the market. The SC is particularly suited to heavy benders because of its wide stance and infinitely adjustable suspension. Initially, the car's rear was a

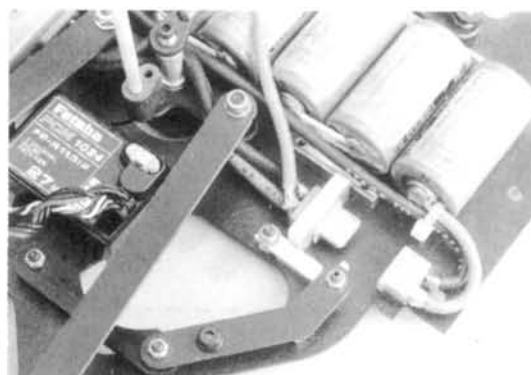
little loose under power, but when I eased the spring tension slightly and added a Bud's Racing\* stabilizer wing, it settled right down.

The SE was also a performer. In an attempt to minimize aerodynamic drag, I initially set it up with only a spoiler. On concrete ovals, however, I usually use a wing (it's allowed by ROAR rules). I didn't feel very comfortable with the car's stability, but after I added a large Bud's bi-level wing, I was much more at ease.

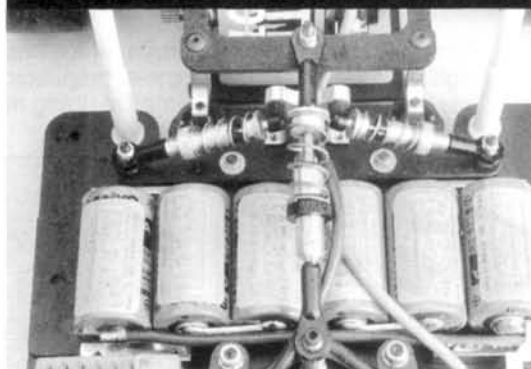
Both cars are extremely responsive to suspension adjustment. The adjusting collar for each shock is finely threaded for ultra-precise adjustments. Also, rear-suspension modifications on both cars make damping and handling more consistent, and the whole rear of the cars more durable.

If I had to rate these cars on a smash-or-trash basis, I'd say that each is a smash. Both are very capable performers; just add a good driver, bake for 4 minutes, and you have a winner!

(Continued on page 170)



Above: You can make battery changes in less than 2 seconds with Hyperdrive's optional quick-change battery system! Both H10s have been drilled to accept this system. Below: Hyperdrive has redesigned its three-shock suspension system so that the vertical shock has its own tower. Extra-fine threads on the shock bodies allow for precise spring-tension adjustment.



## I N D U S T R I E S

## H10SE

**Manufacturer** ..... Hyperdrive  
**Type** ..... On-road  
**Scale** ..... 1/10  
**Price** ..... \$449.95

### DIMENSIONS:

**Overall Length** ..... 18.25 inches  
**Width** ..... 8 inches  
**Wheelbase** ..... 10.25 inches  
**Front Track** ..... 6.375 inches  
**Rear Track** ..... 6.625 inches

### WEIGHT:

**Gross (with battery)** ..... 44 ounces

### BODY:

**Type** ..... Associated Lumina (narrow)\*  
**Material** ..... Polycarbonate

### CHASSIS:

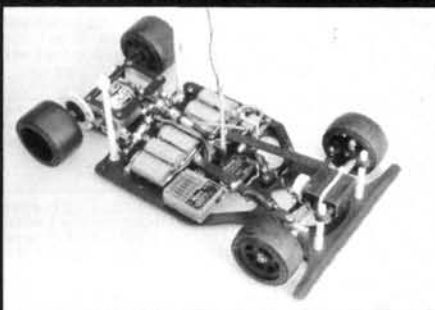
**Type** ..... Plate  
**Material** ..... Graphite

### DRIVE TRAIN:

**Primary** ..... Pinion/spur  
**Transmission** ..... None  
**Differential** ..... Ball  
**Bearings/Bushings** ..... Ball bearings

### SUSPENSION:

**Front: Type** ..... Rigid beam  
**Damping** ..... Floating axle/coil spring  
**Rear: Type** ..... Two-piece T-plate  
**Damping** ..... Three oil-filled, coil-over shocks



### WHEELS:

**Front: Type** ..... TRC NASCAR\*  
**Dimensions (DxW)** ..... 1.8x1.125 inches  
**Rear: Type** ..... TRC NASCAR\*  
**Dimensions (DxW)** ..... 1.8x2.0 inches

### TIRES:

**Front/Rear** ..... TRC T/M radials\*

### ELECTRICS:

**Motor** ..... 05/540\*  
**Battery** ..... 6-cell sub-C\*  
**Speed Controller** ..... Electronic\*

### OPTIONS AS TESTED:

Futaba Magnum PCM transmitter; Airtronics 94151 servo; Novak 410-MXc; Reedy matched, 6-cell, 1400mAh battery; Trinity Tri-Rotor 13-turn, single-wind modified motor; Hyperdrive light aluminum pinion gear; Robinson Racing narrow-profile, 64-pitch spur gear; TRC T/M radials and NASCAR rims.

### COMMENTS:

If you want the absolute best super-speedway car, consider the Hyperdrive H10SE. In addition to its exceptionally well-finished parts and overall high quality, the SE can be precisely adjusted for almost any track. All this, however, comes at a price; many may find the SE beyond their budgets.

\*not included



# Radio Control **Racer**

- Car Action/Futaba  
RC Thunderdrome

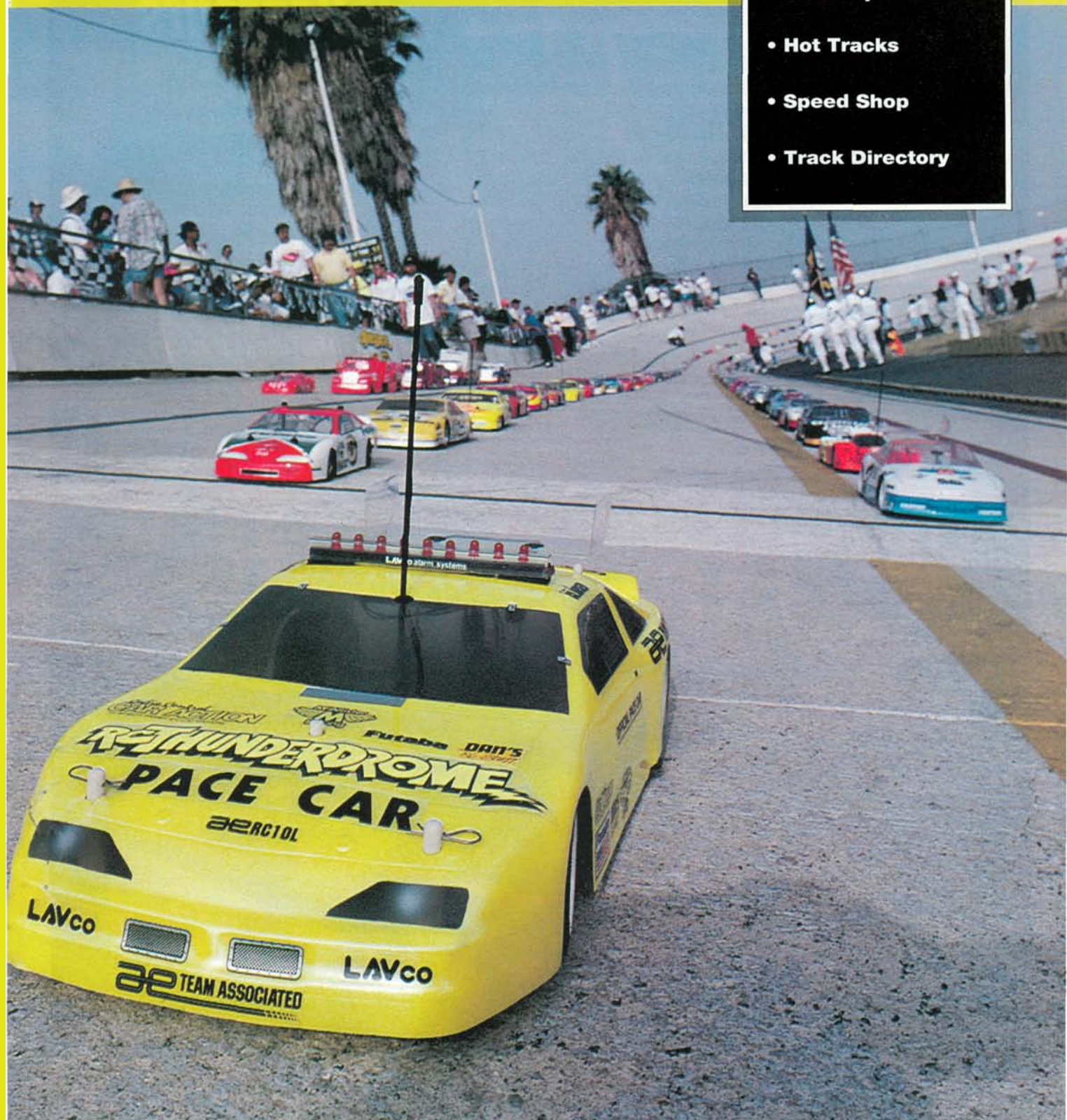
- Wing it!

- Superspeedway  
Roundup

- Hot Tracks

- Speed Shop

- Track Directory





# Radio Control *Racer*

**HERE WE GO** with another installment of *R/C Racer*—a section dedicated solely to competitive R/C enthusiasts. *R/C Racer* is intended to give you, the racer, up-to-the-minute race reports and news on the very latest high-performance hardware.

This month, *Car Action*'s ace photojournalist, John Huber, reports back from the biggest, fastest superspeedway track in the world—the Thunderdrome! I don't want to give away too many details, but I will say that Kent Clausen's old speed record has fallen!

In keeping with the high-speed-oval "flavor" of Thunderdrome, we're also bringing you the "Superspeedway Roundup"—a showcase of all the popular "oval-only" cars. For those who are curious about the intricate workings of wings, check out "Wing It!". Until next month, keep clear of the "hammers"!



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Roundup

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Radio Control  
**Racer**

RADIO CONTROL CAR ACTION / FUTABA PRESENTS

**SUPER  
SHOOTOUT**



# RC THUNDER

ARTICLE & PHOTOS  
BY JOHN HUBER

**T**he Thunderdrome is by far the most awesome R/C race I've ever attended. Until I went to 1990's event, I had never seen racing at such speeds, on such a huge track. It blew me away! I was lucky enough to return in 1991, for the fourth annual Superspeedway Shootout, in Encino, CA, on September 13, 14 and 15, at the Encino Velodrome—better known as the Thunderdrome. Race organizers Dan Moynihan of Dan's RC Stuff and Gary McAllister of McAllister Racing have made this event the pinnacle of high-speed R/C racing.

The weather played a major role at the 1990 race, when 150-degree track temperatures ravaged the capped tires. In 1991, the temperature was much cooler owing to cloud cover on Friday and Saturday (the days



# SPEEDWAY Hot Out!



# THUNDERDROME<sup>®</sup>

that were set aside for practice).

The Thunderdrome was a great place to meet and talk with the pros. Teams from Associated/Reedy, Andy's, Bolink, Bud's Racing, B&R, Braun Distributors, Cam, Custom Works, Team Cobra, East Coast, Fantom Motors, Futaba, Hyperdrive, HPI, McAllister, Mach One Racing, Novak, Pure-Tech, Race Prep, Revtech, Tekin, Team Wise Guys and more were present. (I apologize if I left anybody out!) Spectators and racers strolled through the pro pits to see—and ask about—the new products that were on display.

## HIGH-SPEED HYSTERIA!





Race organizer Dan Moynihan and Miss Thunderdrome, Renee McCracken, were ready to greet the winners in the infield.

## HOLY MOLY!

For the first time at any R/C race ever held, 20—count 'em, 20—cars raced at once! Because this was the first time that it had ever been tried, only the pros had the chance to experience this thrill. To ensure that it would come off without a hitch, the organizers used the AMB System 20, a

lap-counting system, and NORRCA president J.R. Sitman was there to make sure that it worked. And oh, boy, did it work!

Usually, 10 cars on a track makes the racing tight. Sure, the pack will spread out, but the action will still be close. At

the Thunderdrome, which is 950 feet around and wider than most tracks, the cars can spread out a little more. Well, what better way to liven things up than to throw in *another* 10 cars? If you think that this is some new type of Insane Speed Run, you're wrong! It's

the closest thing to full-size racing that I've ever seen at an R/C track.

As they entered the first turn, the cars were a sight to behold. Not every car made a successful start, but those that *did*, hit the 33-degree banked turn and took off as if they

track was 70.1mph—mighty fast—and, in 1991, there were many attempts to break it. How much faster can we go? As I talked with Cliff Lett about his car, he gave me a few valuable clues.

For a car to move 70mph, its tires must turn from 11,000 to 12,000rpm. Cliff figures that, at 70mph, with 19 cells and two motors, his motors turned between 75,000 and 80,000rpm! The twin 15-turn motors, provided the power of one 7.5-turn motor (if such a thing existed), and limited the chance of motor failure under such high current situations by splitting the load. During practice, in a run that was reported as an unofficial 78mph, he noticed that the rear of the chassis was bottoming out. Cliff checked how much weight it took to force the car down, and he figured that the car pulled between 2 and 3.5Gs. The wide GTP Nissan body didn't have

wheel cutouts, so it created a vacuum under the car. This made the car easier to control, and it also increased downforce. Other problems

cross the counting loop once more to finish. Had he continued, his last lap would have been slower, and it would have knocked down his average speed, but he still would have finished with the 2nd-best single-lap speed. He may not have taken home a trophy, but he pulled some fast lap times!

## INSANITY IS BIG BUSINESS...75.9 MPH

prevented Cliff's car from breaking Kent Clausen's new 75.9mph record, but he averaged 64.1mph, and he finished 5th.

This year, Team Astro was ready for action with Tim Smith. Tim, usually a drag-racer, got to show everyone that he could go fast for more than a few seconds at a time! A misunderstanding was the only thing that kept Tim from ranking in the speed run. The rules call for 1-minute runs. He ran for a minute but, on his last lap, the car's tires blew out. He pulled the car off the track without realizing that he had to

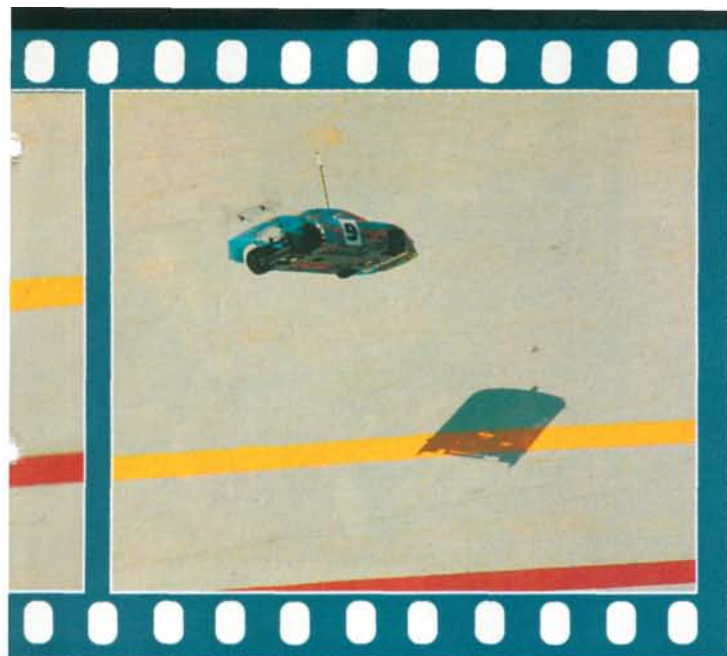
Tom Bowlin's truck was another wild speed vehicle. It was a McAllister Fly'n "M" loaded with 24 cells and twin Team Astro motors. This monster had the whole crowd chanting, "Truck! Truck! Truck!". It didn't break the speed record, but it was a big attraction, and it showed just how wacky this event can be.

I love Insane Speed Runs because they really give the participants something to shoot for. With their creativity unchecked, the racers can build their own land missiles. When you tell people to get out there and go fast, they listen!



**W**hat makes us want go faster? The sound of a car whizzing by at 65mph or more? The sight of a car crashing into a wall at top speed and exploding into 100 pieces? The smell of toasted motors in the air? Well, I'm not sure what it is, but the Insane Speed Run may be the hottest part of the Thunderdrome race. As of 1990, the speed record on this





were going to fly. During the 14-minute qualifying runs, the cars spread out so it appeared that there were at least four races occurring at once, each separated by a few dozen feet.

With so many cars on the track at once, time was critical, and any pit stop that lasted for

more than a few seconds cost the drivers precious laps. The 20 pit-stop spaces were only about the length of the cars, which made it tricky for the drivers to find the right one as they exited the track. The teams that practiced could pick up their cars, remove the

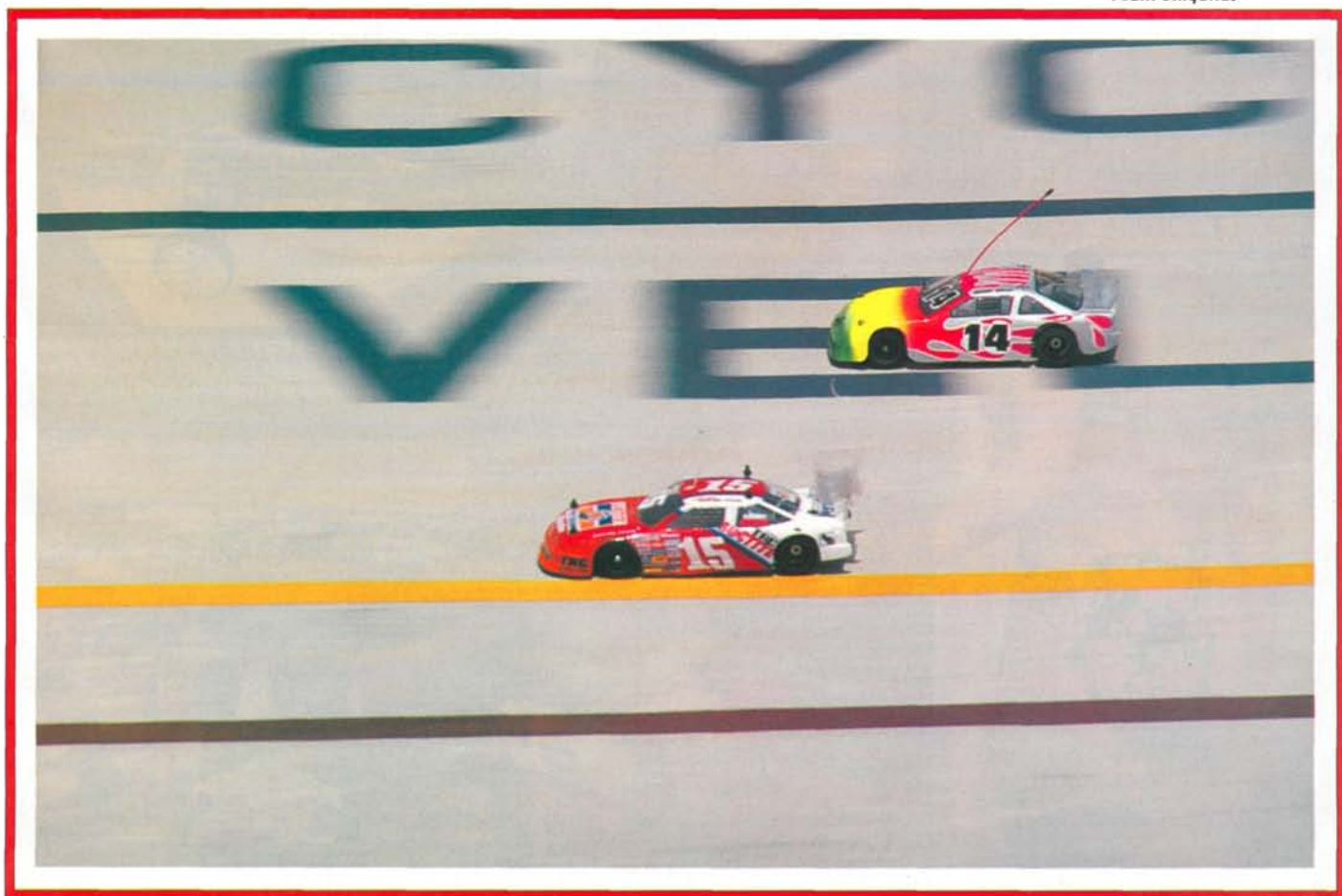
batteries in one motion, and then launch the car while freshly peaked batteries were installed. This year, a 5-second pit rule stated that if a car came into the pits too fast, or if a pitman had to put both of his feet over the pit wall, the car's time would be penalized five seconds.

### THE PITS

The pit-work area was located just outside the track under two huge tents. One was for the amateurs, who raced in the Futaba Amateur Challenge, and the other was for the pros, who competed in the *Car Action* Superspeedway Shootout.



*Team Chiquita.*







Above and right: The race's most interesting speed-run vehicle: Tom Bowlin's 24-cell, twin-motor, insane speed-run machine.



Team Astro's speed-run car was most impressive. Unfortunately, it blew a tire on the last lap and blew its chances of winning.



Will Handzel of Circle Track won the celebrity race. (I think he might have been practicing since last year.)



The color guard from the San Diego Naval Training Center was on hand for the opening ceremonies.



A local news crew meets the racers. The TV broadcast on Friday night attracted hundreds of spectators to the track on the following days.



Although it never hit the track, it was one of the strangest vehicles at the race. I guess you'd call it a car, but it was more like a motorcycle with outboard wheels.



There was pit space for all the racers under two huge tents. Under the pros' tent, you could visit manufacturers and check out their latest wares.



There were many products on display in the pros' tent. It was a great place to check out the latest bodies, accessories and other cool R/C stuff. There were dynos galore—from Bud's, Tekin, Lavco and a computer-controlled dyno from RSR—and it seemed that each team tried to make its motor scream the loudest. Andy's R/C products was there with its latest Lexan creations, as was a new company called Protoform. If you needed parts, Pegasus Hobbies had an on-site hobby shop.

### INSANITY SETS IN

The Insane Speed Run, in which the pros are allowed to take shots at breaking the Thunderdrome speed record, was crazier than ever. (It has almost no rules, so the sky's the limit!) Joel Johnson wasn't present, but



*Al Messing of T&A Machining checks Bud's winning car to see that it's legal, i.e., it rolls through the tech box and meets the requirements with regard to width, height and length.*

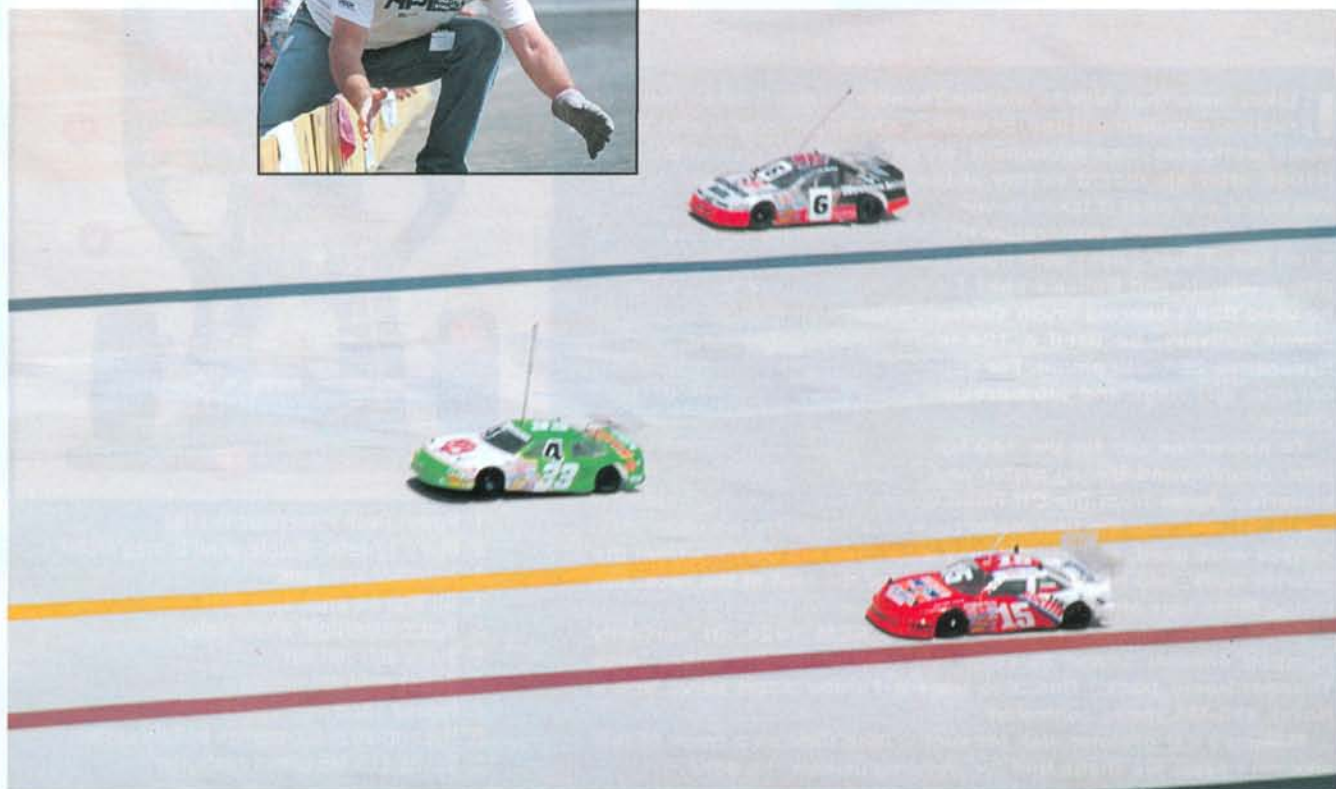
Custom Works brought two cars that were very similar to the 4WD car that he used at the

1990 T-Drome. Twenty cells and two direct-drive-system (front and rear) motors powered each car. Tyree Philips and Bob Novak of Novak Electronics piloted the Custom Works machines.

Top drag-racer Tim Smith ran Team Astro's hot entry. It

was a mostly stock 10LSS outfitted with a narrow, wedge body and powered by 16 cells.

Cliff Lett of Team Associated felt so good about his recent 4WD Worlds victory that he used a Yokomo in his speed run—that's right, an off-road car! Of course, he modi-





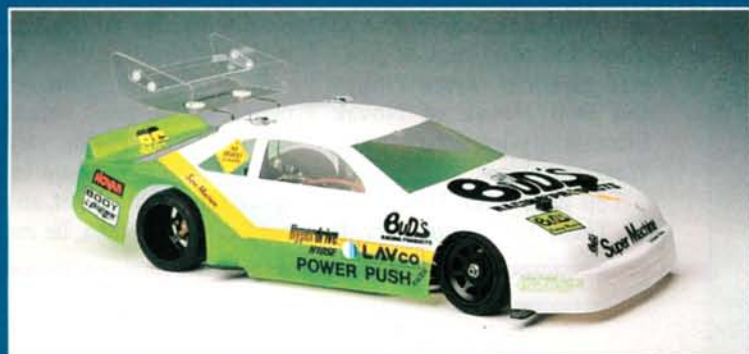


Winners of the 140 lap pro superspeedway main: Bud Bartos, Craig Perry and Bob Novak.

## PRO SUPERSPEEDWAY A-MAIN

Fin.	Driver	Laps	Team	Motor	Chassis	Body	Radio	Tires
1	Bud Bartos	140	Bud's	Bud's	Hyperdrive	Bolink	KO	TRC
2	Craig Perry	137	Bolink	East Coast	Bolink	Bolink	Futaba	Bolink
3	Bob Novak	136	Novak	Reedy	Associated	Associated	KO	TRC
4	Cliff Lett	132	Associated	Reedy	Associated	Associated	Airtronics	TRC
5	Don Rice	124	Futaba	B&R	Bolink	Bolink	Futaba	TRC
6	Mike Garrett	120	Bolink	Revtech	Bolink	Bolink	Futaba	Pro Star
7	Ricky Jordan	119	Bolink	Cam	Bolink	Bolink	Futaba	Bolink
8	Kent Clausen	109	Associated	Reedy	Associated	Associated	Futaba	TRC
9	Steve Rule	106	Bolink	Cam	Bolink	Bolink	Futaba	Bolink
10	Roger Vorba	105	Revtech	Revtech	Bolink	Bolink	Futaba	Bolink
11	Derek Povah	90	Pure-Tech	Cobra	Cobra	n/a	n/a	n/a
12	Tom Clark	82	Race Prep	Race Prep	n/a	n/a	n/a	n/a
13	Roger Payne	52	B&R	B&R	Associated	McAllister	n/a	n/a
14	Ted MacDonald	51	Race Prep	Race Prep	Associated	Lumina	Futaba	TRC
15	Dave Pulfer	44	McAllister	Fantom	McAllister	McAllister	Tekin	Twinn-K
16	Jason Altzman	41	Mach One	Mach One	Bolink	Bolink	Futaba	Bolink
17	Ralph Burch	36	Hyperdrive	Cam	Hyperdrive	Bolink	Futaba	Pro Star
18	Steve Dunn	19	Race Prep	Race Prep	TRC	Pontiac	Airtronics	TRC
19	Mike Boylan	18	Braun Hobby	Twister	Hyperdrive	Bolink	Futaba	TRC
20	Shawn Ireland	4	Associated	Reedy	Associated	Associated	Futaba	TRC

## DIS BUD'S FOR YOU!



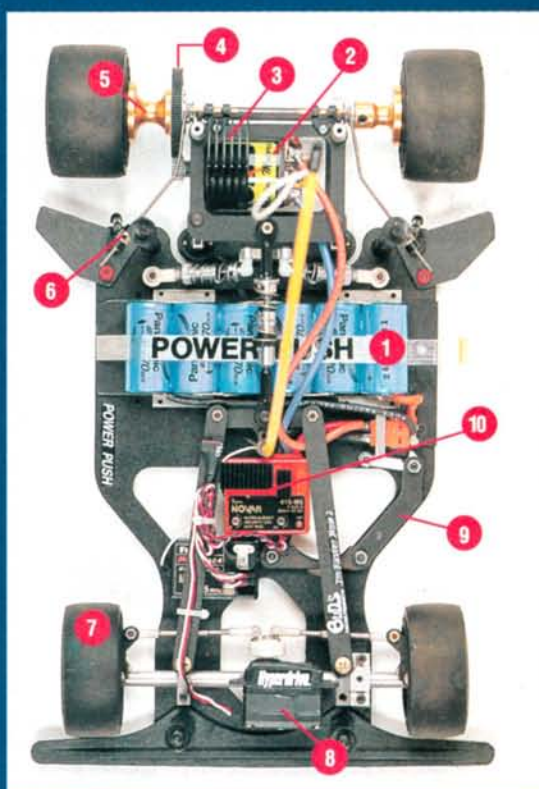
It takes more than luck to win the Thunderdrome. It takes hours of practice, commitment and, of course, a killer pit crew. It also takes some pretty awesome equipment. We got our hands on Bud Bartos's H10SE after his recent victory at the 1991 Thunderdrome so that you could see what it takes to win.

Bud started with a Hyperdrive H10SE quick-change car. He added a full set of Bud's light gold hubs, Bolink gold dot radials on composite wheels and Bolink's light T-Bird body. On the front wheels, he used Bud's bearing crush sleeves. To provide smooth and quiet power delivery, he used a 104-tooth Du-Mor spur gear with a Hyperdrive 28-tooth pinion. For super-smooth diff operation, Bud's ceramic diff rings and ultra-precision diff balls were his obvious choice.

To power the car for the 140-lap main event, Bud used his 12-turn, double-wind U-mag motor and Power Push Panasonic P-170 batteries. Aside from the Off-Road World Championships held earlier in '91, this was the first major race in which batteries other than Sanyos were used, and boy did they work! Bud led the race from the quarter mark, and he retained the lead for the rest of the race, finishing three laps ahead of the 2nd-place car.

Bud's radio of choice is the Futaba PCM 1024. (It certainly pumped enough power to keep full control on the super-large Thunderdrome track.) Bud also uses a Futaba 132H servo and a Novak 410-M5 speed controller.

Making a car perform well for such a long time on a track of this size isn't easy. We thank Bud for showing us how it's done.



1. Power Push Panasonic P-170s
2. Bud's 12-turn, double-wind U-mag motor
3. Holeshoot heat sink
4. Du-Mor 64-pitch spur gear
5. Bud's superlight wheel hubs
6. Bud's anti-roll bar
7. Bolink gold dot radials
8. Futaba 132H high-speed servo
9. Hyperdrive quick-change battery system
10. Novak 410-M5 speed controller



## ARIBA, ARIBA! ÁNDALE, ÁNDALE!

At any large race, you'll find people who've traveled great distances—even from other countries—to attend. I spoke with Luís, a member of an 11-man Mexican team that had heard about the awesome Encino track and made the long journey to race there.

This was the team's first major U.S. race and, according to Luís, they had a great time. They only had one problem: they usually raced for 3 minutes, not 4, and this made adapting to the track difficult.

They ran the types of car we're used to seeing, e.g., 10L, Cobra, Hyper 10, Corally and Lynx. Although their equipment was up-to-date, they found it difficult to compete against the high-caliber Thunderdrome drivers. All in all, the guys had a great time, and team member



Victor Babafiya took 3rd in the Concours. They might not have all made it into the A-Main, but they learned a lot and had a blast doing it.

fied it extensively to handle the speed, but it was still a YZ-10. By removing the front differential and the drive belt, and adding another motor in front of the spur gear, he made an awesome speed machine.

Kent Clausen, though, showed everyone how it was done by setting the record once again. His narrow 10L with a Jaguar body cranked out a 75.9mph single-lap run—with an average speed for one minute of 73.2mph. His car was powered by a Reedy Mr. M motor and 12 cells. (We'll take a closer look at it in the next issue.)

### SHOOTOUT SUNDAY

Sunday was *the* day. The opening ceremony featured officers from the San Diego Naval Training Center Color Guard and the national anthem. Of course, Dan Moynihan and his bright yellow banana suit were right there in the middle of it all. Then came the Concours Event. A parade of cars stretched almost halfway around the track. Judges and spectators examined the fine work on display. I wish I could describe all the great cars I saw, but there were just too many. First-place winner Duane Abrego's great-looking Coke car was complete in every detail—right down to the

1/10-scale Coke can on the dash. Second place went to Fred Medel for his colorful and unique Nike car. Mexico's Victor Babafiya took the 3rd spot. Nicolas Schons, who was

people scattering, but they were quick to forgive her.

### RACING

Finally, it was time for the big events: the Mains and the

**For the first time at any R/C race ever held, 20—count 'em, 20—cars raced at once!**

also the youngest racer at the Thunderdrome, won the special truck category.

### CELEBS

Each year, a group of "celebrities" races in a special class. They're not allowed to practice; they're given identically prepared Bolink cars; and they're sent on their merry way. Some of these people have never raced on a track of this size, and some have never even tried R/C!

Seven cars entered the 1991 race. Most of them finished. Will Handzel of Circle Track magazine, J.R. Sitman, and Forrest Bond of Racefax took the top three positions. The real disappointment came from Renee McCracken, Miss Thunderdrome 1991. Her full-speed charges at the impound table sent more than a few

Superspeedway Shootout. Twenty of the top pros were going to battle it out through 140 laps in a test of power, endurance and skill. As the race started and the huge pack headed for turn one, Kent Clausen grabbed the lead in first lap. Cliff Lett took over

after about 1 minute, with Bud Bartos close behind in 2nd. By the time the cars began to enter the pits for fresh batteries, Bartos was in the lead, followed by Craig Perry and Lett. This was just the start of Bartos's domination of this race.

At the 22-lap mark, Perry was in the lead, followed by Clausen and Bartos. Perry led the pack until almost a quarter of the way through the race, when Bartos and Clausen moved up again. It was then that Bartos said, "Goodbye!" and moved ahead. Eleven minutes into the race, Bartos

## Radio Control CAR ACTION MAGAZINE





## PRO MODIFIED 4-MINUTE MAIN

Fin.	Driver	Laps
1	Roger Payne	21
2	Bud Bartos	21
3	Mike Garrett	20
4	Craig Perry	20
5	Mike Boylan	20
6	Shawn Ireland	20
7	Cliff Lett	20
8	Tom Clark	20
9	Dave Pulfer	20
10	Ricky Jordan	20
11	Derk Povah	19
12	Bob Novak	19
13	Steve Pule	19
14	Roger Vorba	19
15	Jason Altzman	17
16	Steve Dunn	11
17	Don Rice	4
18	Ted MacDonald	3
19	Kent Clausen	DNS
20	Ralph Burch	DNS

## MOD EXPERT A-MAIN

Fin.	Driver	Laps
1	John Peterson	21
2	Gary Hamilton	21
3	Roy Powell	21
4	Craig Baxter	21
5	David Markert	21
6	Don Ham	21
7	Danny Egger	21
8	Joe MacGregor	21
9	Steve Allen	20
10	Frank Killam	20

## MOD SPORTSMAN A-MAIN

Fin.	Driver	Laps
1	Nic Case	21
2	Mark Figuerado	20
3	Ron Brown	20
4	Ben Dee	19
5	John Howshall	19
6	Bryant Thomas	18
7	Adam Crippen	17
8	Duane Abrego	16
9	Bruce Ashmore	11
10	Danny Batinich	3

## FUTABA AMATEUR CHALLENGE A-MAIN

Fin.	Driver	Laps
1	Joe Ward	18
2	Kurt Perham	18
3	Roland Chavarry	18
4	Brett Patti	18
5	Thomas Logan	18
6	Don Winans	18
7	Curt Norheim	18
8	Rick Stuart	17
9	Brian Eriksen	17
10	Robert Picone	15

**THE CURRENT  
SPEED RECORD  
IS 75.9MPH;  
WHAT WILL IT  
BE THIS YEAR?  
MAYBE WE'LL  
SEE...I DON'T  
KNOW...80?—**

had a lap on the field; 7 minutes later, he was two laps up. Perry held onto 2nd, followed by Bob Novak. (This year, Bob managed to keep all four wheels on the car.) All three held their positions for the duration of the race. Bartos turned out 140 laps in slightly more than 27 minutes and he finished three laps ahead of 2nd-place Perry and four ahead of Novak. Lett, Don Rice, Mike Garrett, Rick Jordan, Clausen, Steve Rule and Roger Vorba rounded out the top 10. The 1st and 10th cars were separated by 35 laps.

In the Modified Expert A-Main, John Peterson placed 1st, followed by TQer Gary Hamilton and Roy Powell. Nic Case won Modified Sportsman, with Mark Figuerado and Ron Brown taking 2nd and 3rd. TQer Joe Ward won the Futaba Amateur Challenge, followed by Kurt

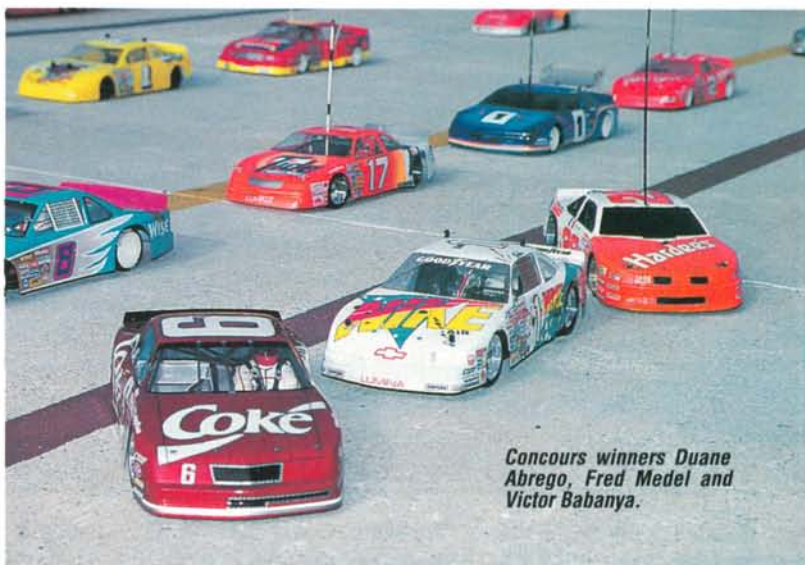
Perham and Roland Chavarry. Andy Efta won the Sportsman award in the Stock Class, and Danny Batinich took that honor in the Modified Class.

### WHAT'S NEXT?

After all this, I can't wait to see what happens at the 1992 race! The 20-car field was amazing, and I think that the amateurs should use it, too. Not only did it speed up the program, but it also heightened the action.

OK, so the current speed record is 75.9mph; what will it be this year? Maybe we'll see...I don't know...80?—85?—90? And what about those *oval trucks*! What's next? LTO superspeedway 18-wheelers?

Many people made the '91



*Concours winners Duane Abrego, Fred Medel and Victor Babanya.*

Thunderdrome successful. *Car Action* thanks (in no particular order): Al Messing of T&A Machining; Dave Warner; Len Lee; Harry and Julie Bogosian; Jerry and Silvia Meisenzahl; Sot Bogosian; Bob Sarnell Electric; Cerwin Vega; Eagle Products; Futaba; Steve Prichett and the balloon gang; San Deigo Naval Training Center Commander Ken Bassett; Protoform; Paragon; Scat; Nova; Tekin; Kimbrough; Hyperdrive; Associated; B&R Motors; Quarter Flash Motors; Revtech; Pegasus Hobbies; Bolink; AMB; HPI; CKW; Andy's; Bud's; J.R. Sitman; Ernie Prince; Dave Pulfer; Danny Batinich; Cobra; and all the racers. See you this year! ■

### INSANE SPEED RUN

Fin.	Driver	No. of Cells	Avg. mph
1	Kent Clausen	12	73.2
2	Bob Novak	20	69.9
3	Tom Clark	10	67.9
4	Frank Killam	16	65.1
5	Cliff Lett	19	64.1
6	Tyree Phillips	20	67.8
7	Roger Vorba	9	63.5
8	Ken Moon	n/a	60.9
9	Mike Boylan	12	60.3
10	Sally Ham	8	57.4

### CELEBRITY RACE

Fin.	Driver	Claim to Fame
1	Will Handzel	Circle Track
2	J.R. Sitman	NORRCA president
3	Forrest Bond	Racefax
4	Kelly Sanders	Cerwin Vega
5	Doug Kott	Road & Track
6	Dan Moynihan	Dan's RC Stuff
7	Renee McCracken	Miss Thunderdrome



# SPEED SHOP

Descriptions of the products shown on these pages were derived from press releases supplied by manufacturers and/or their advertising agencies. The information given is neither an endorsement of the product by *Radio Control Car Action*, nor a guarantee of performance or safety. If you write to the manufacturer about any product described here, be sure to say that you read about it in *Radio Control Car Action*.

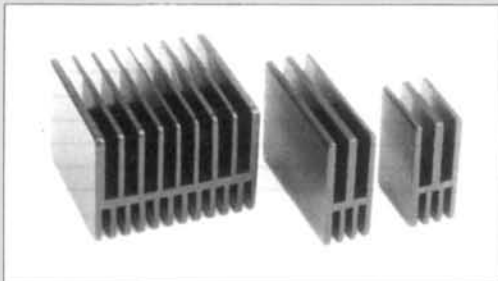


## CARTER DIAMOND TOOL CORP.

### • Commutator Turning Tool

Diamond-trued commutators help to increase your motor's speed and produce long-lasting power by reducing voltage loss. Carter's synthetic-diamond tool fits most commutator-turning lathes. It's an excellent refurbishing tool that produces clean-cut surfaces with no "drag over." Custom-designed, application-specific tools are also available.

For more information, contact Carter Diamond Tool Corp., 4475 Hamann Pky., Willoughby, OH 44094.



## HOLESHOT RACING PRODUCTS

### • ESC Heat Sink

This black-anodized aluminum heat sink was designed to cool your ESC more efficiently. It has a 30-percent larger cooling surface, and it weighs 20 percent less than other heat sinks. It fits Novak 828, T-1X and 410 MXc controllers.

Part no. 2020

Price: \$15.95

For more information, contact Holeshot Racing Products, P.O. Box 630, Canton, MA 02021.

## PARMA INTERNATIONAL

### • Molded Brushes

Parma's new molded motor brushes are perfect for racing applications.

The Power brushes have silver shunt wire with eyelets and a high graphite content to provide greater torque for off-road racing. The softer, low-graphite RPM brushes also have silver shunt wire with eyelets, but they're designed to provide more rpm for on-road racing.

For more information, contact Parma International, 13927 Progress Pky., N. Royalton, OH 44133.



## TRAXXAS

### • Pro-Series Springs

These new stainless-steel springs won't shrink or corrode. Made of larger-diameter wire, they provide more consistent action for improved handling. They're available in several degrees of firmness, and they're color-coded for easy identification.

Part nos. 4750 (ultra-soft front); 4751 (soft front); 4755 (soft rear); 4758 (firm rear); 4759 (extra-firm rear).

For more information, contact Traxxas Corp., 12150 Shiloh Rd. #120, Dallas, TX 75228.





## BOLINK

### • Blue Lightning

Bolink's Blue Lightning tire cleaner is made exclusively for rubber-capped tires. Easy to use, it removes old rubber and conditions the tire surface to make your old tires look like new.

Part no. BL-6032

Price: \$ 6.95

For more information, contact Bolink R/C Cars Inc., 420 Hosea Rd., Lawrenceville, GA 30245.



## TEAM LOSI

### • Profiled Spur Gears

The technology used in the ultra-efficient, profiled spur gears for the JR-X Pro and JR-XT is now available in spurs for all popular 1/12- and 1/10-scale "pro" differentials. The gears' contours and the profiled shape of their teeth provide unequalled performance and run time. A removable dust shield prolongs diff life. The 48-pitch gears also feature a grease pocket molded into each of the 12 ball pockets. They're available with 82, 84, 86, 88, 90, or 92 teeth, and each size is molded in a different brilliant color.

Price: \$ 3.50

For more information, contact Team Losi Inc., 13848 Magnolia Ave, Chino, CA 91710.



## C&M TEAM COBRA

### • Venom 24 Stock Motor

This '91 ROAR-legal stock motor can develop as much horsepower and speed as most 36- to 44-degree timed motors. It has a slotted-arm design and comes with two sets of brushes and springs that maximize motor performance.

Part no. 1127

Price: \$28

For more information, contact C&M Team Cobra, P.O. Box 701-353, W. Valley City, UT 84170.



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RCC1501—Chrome	Ladder Bars (4 pcs)	\$13.99
RCC1502—Chrome	Axle Hsgs. (4 pcs)	\$8.99
RCC1503—Chrome	Suspension Braces (4 pcs)	\$4.99
RCC1504—Chrome	Gear Cases (1 pr)	\$13.99
RCC1505—Chrome	Wheel Hubs (4 pcs)	\$3.99
RCC1506—Chrome	Shock Covers & Mts.	\$11.99
RCC1507—Chrome	Body Mts. (4 pcs)	\$3.99
RCC1508—Chrome	Battery Covers	\$5.99
RCC1509—Chrome	Steering Knuckles (4 pcs)	\$11.99
RCC1510—Chrome	Upr. Radio & Chassis Plate	\$8.99
RCC1511—Chrome	Rod Ends (16 pcs)	\$3.99
RCC1512—Chrome	Gear Box Bumper	\$6.99
RCC1513—Chrome	Body Brackets, Servo Mts.	\$4.99
RCC1514—Chrome	Rim Set (1 pr)	\$10.99

### BLACKFOOT/MONSTER BEETLE

RCC0500—Chrome	Chassis	\$16.99
RCC0501—Chrome	Gear Cse, Mtr Cvr, Trail Arms	\$10.99
RCC0502—Chrome	Front Suspension (8 pcs)	\$9.99
RCC0503—Chrome	Steering Uprights	\$3.99
RCC0504—Chrome	Front & Rear Body Mts.	\$6.99
RCC0505—Chrome	Front Lower Bumper	\$4.99
RCC0506—Chrome	Roll Bar & Fog Lights	\$6.99
RCC0507—Chrome	Front & Rear Shocks	\$6.99
RCC0508—Chrome	Frt & Rr Shock Mts, Servo Cvr	\$9.99
RCC0509—Chrome	Rear Hubs (1 pr)	\$2.99
RCC0510—Chrome	Front & Rear Wheel (1 ea)	\$9.99

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**I**F YOU'VE seen a few heats of  $1/10$ -scale oval racing, you'll agree that it would be harder for races to be run any more closely. It's a game of inches, and every little inch counts. In the past, cars had to work on ovals as well as roadcourses, and most designs were good enough; but as the racing became more competitive, every little gain-an-edge hop-up was given a try.

Always innovative, the people at Team Associated\* weren't satisfied with the RC10L's performance on larger ovals because they realized that on-road cars must be able to take sharp turns at high speeds and handle switchbacks. Oval cars, on the other hand, have to reach blistering speeds and maintain them through large sweeper turns.

Many  $1/10$ -scale cars were just scaled-up versions of successful  $1/12$ -scale cars, which, since they had been around for a long time, had pretty much been improved

as much as the rules allowed. These scaled-up cars were low and wide—just the thing for on-road racing, since a wide car is more stable through turns.

People were content until things got serious. Associated set out to design a car that would work on oval tracks everywhere, and after looking at a NASCAR rule book and taking a trip to the local Chevy dealer, they came up with a plan. They found that a narrower car is a faster car. Why? I don't

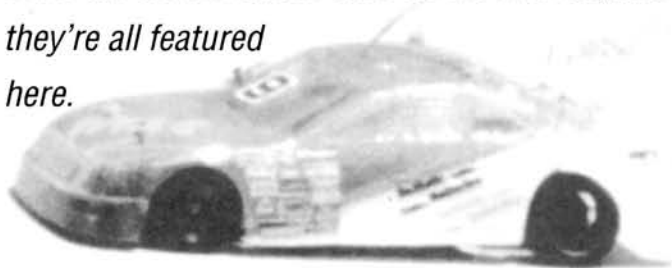


want to go into the complicated theory of aerodynamics, but a car with a narrow front suffers less from drag than a car with a conven-

HIGH-BANK

*tional (wide) one, so a narrower car goes faster down the straights. For on-road racing, wide may be the way to go, but for oval, you can sacrifice some of the stability offered by a wide car for the speed of a narrow one.*

*Many manufacturers have jumped on the idea of a car designed just for oval racing. To date, there are seven narrow cars on the market, and they're all featured here.*



P E R S P E C T I V E W A Y  
**SUPERSPEEDWAY**

ER S P E E D W A Y  
**Roundup**

by ALEX STROUTHOPOULOS

SUPER  
SPEED  
W A Y  
**BOMBERS**



# SUPER SPEED WAY Roundup

## Associated RC10L Superspeedway

Team Associated started it all with their redesigned version of the highly successful RC10L. The RC10L SS (for short) kit is available in two versions: graphite and fiberglass. Both have a T-plate rear suspension (with a coil-over oil-filled shock) and a floating-kingpin front suspension. The graphite kit comes with a graphite chassis, upper rear pod plate, axle and front cross-brace. Rear damping is done by means of one of Associated's short oil-filled shocks and a set of pressure plates. The RC10L SS comes with a rear chassis brace that not only stiffens the chassis, but also raises the body posts and stiffens the center damper tube. In the capable hands of Team Associated's Cliff Lett and Kent Clausen, the RC10L SS proved its worth by taking the Insane Speed Run at the '91 Thunderdome and the overall win in '90. It has a proven track record.

▼ The RC-10L SS started the narrow-car mania that has swept the nation. The 10L SS's design is very much like that of its wider sibling—the RC-10L.

◀ A small oil-filled coil-over shock is used with pressure plates to keep the rear end on the ground at all times. Note the nerf wings that prevent the rear axle from snapping.

## Superspeedway 10L

Manufacturer ..... Associated Electrics  
Price ..... \$235

**DIMENSIONS:**  
Overall Length ..... 14.25 inches  
Width ..... 8.4 inches  
Wheelbase ..... 10.25 inches  
Front Track ..... 6.25 inches  
Rear Track ..... 5.80 inches

**WEIGHT:**  
Gross (w/bat.) ..... 44.4 ounces

**BODY:**  
Type ..... Not included

**CHASSIS:**  
Type ..... Pan  
Material ..... Graphite

**DRIVE TRAIN:**  
Primary ..... Pinion/spur  
Transmission ..... Direct drive  
Differential ..... Ball  
Bearings/Bushings ..... Ball bearings

**SUSPENSION:**  
Front: Type ..... Suspension arms  
Damping ..... Coil spring  
Rear: Type ..... T-plate  
Damping ..... Oil-filled, coil-over/pressure plates

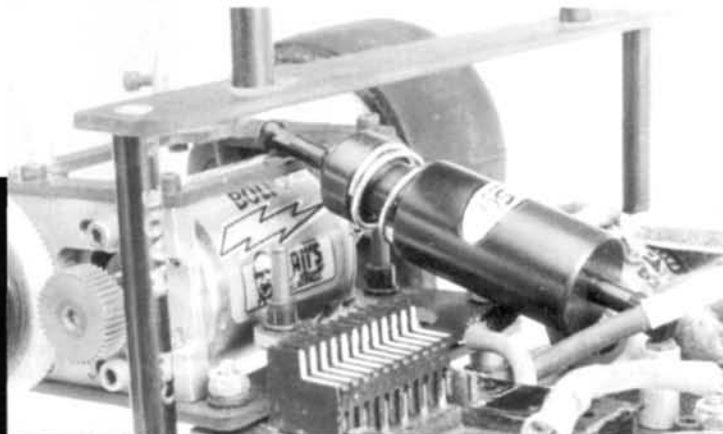
**WHEELS:**  
Front: Type ..... 1-piece nylon  
Dimensions (DxW) ..... 1.8x1.25 inches  
Rear: Type ..... 1-piece nylon  
Dimensions (DxW) ..... 1.8x2 inches

**TIRES:**  
Front/Rear ..... Green-dot foam

**ELECTRICS:**  
Motor ..... Not included  
Battery ..... 6-cell pack\*  
Speed Controller ..... Not included  
\*not included

▼ One of the 10L SS's unique features is that its battery cells can be mounted in saddle or stick formation.

► A silicone rear damper makes suspension supersmooth. The two small posts under the damper are the load actuators that keep lateral motion in check.



Manufacturer ..... Advanced Racing Technology  
Price ..... \$240

#### DIMENSIONS:

Overall Length ..... 18.25 inches  
Width ..... 8 inches  
Wheelbase ..... 10.5 inches  
Front Track ..... 5.75 inches  
Rear Track ..... 6 inches

#### WEIGHT:

Gross (w/bat.) ..... 43.42 ounces

#### BODY:

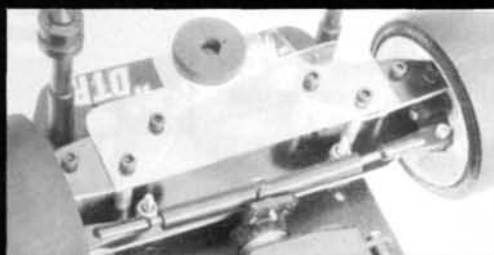
Type ..... Not included

#### CHASSIS:

Type ..... Pan  
Material ..... Graphite

#### DRIVE TRAIN:

Primary ..... Pinion/spur  
Transmission ..... Direct drive  
Differential ..... Ball  
Bearings/Bushings ..... Ball bearings



The front end of the DTR has the same, almost indestructible, front end as all other ART cars. The center-point steering reduces Ackerman when the car is turning.

#### SUSPENSION:

Front: Type ..... Floating front axle  
Damping ..... None  
Rear: Type ..... T-plate  
Damping ..... Silicone shock with load actuators

#### WHEELS:

Front: Type ..... 1-piece nylon  
Dimensions (DxW) ..... 2x1 inches  
Rear: Type ..... 1-piece nylon  
Dimensions (DxW) ..... 2x1.5 inches

#### TIRES:

Front/Rear ..... Not included

#### ELECTRICS:

Motor ..... Not included  
Battery ..... 6-cell stick pack\*  
Speed Controller ..... Not included  
\*not included

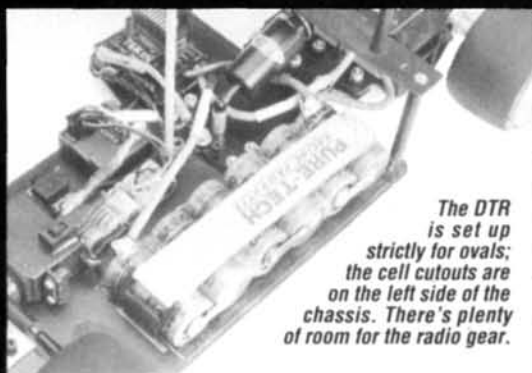
## Advanced Racing Technology Agitator DTR

For some time, Advanced Racing Technology\* has offered some of the

most innovative designs on the R/C road racing circuit, and now it has brought its expertise to the world of oval racing. The new Agitator DTR (Don't Turn Right) has the superb Agitator front end. Its durable, caster adjustments are easy to make, and they stay set. The front end is bolted to a graphite chassis that's set up for a left-side bias; and center-point steering eliminates Ackerman, which isn't needed for oval racing.

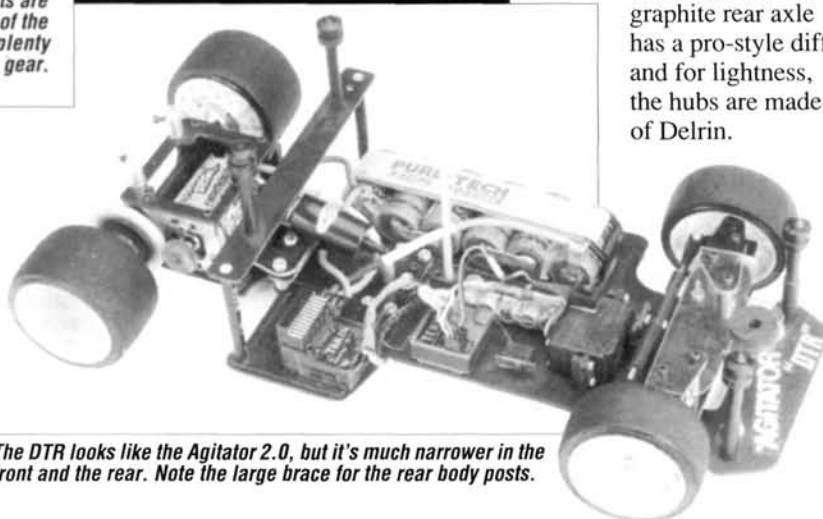
On the rear, two posts support a graphite brace, which has body posts mounted on it. This helps to strengthen the rear end and reduce chatter through turns. The rear suspension consists of a silicone damper, a T-plate with a rocker ball, and a pair of ART's famous Load Actuators. With the T-plate and rocker ball, the load actuators control the car's lateral (side-to-side) damping, while the silicone damper and T-plate control its vertical (up-and-down)

damping. The car's graphite rear axle has a pro-style diff, and for lightness, the hubs are made of Delrin.



The DTR is set up strictly for ovals; the cell cutouts are on the left side of the chassis. There's plenty of room for the radio gear.

# Agitator DTR



The DTR looks like the Agitator 2.0, but it's much narrower in the front and the rear. Note the large brace for the rear body posts.



## TRC/Composite Craft Lynx II SS

The TRC/Composite Craft\* Lynx II Elite is one of the most successful on-road cars on the market. With its fully floating rear suspension, it's a terror on bumpy tracks. Now, TRC has introduced a narrower version of the Lynx II—the Lynx II SS, which is similar to the standard Lynx, but has differences that make it more competitive.

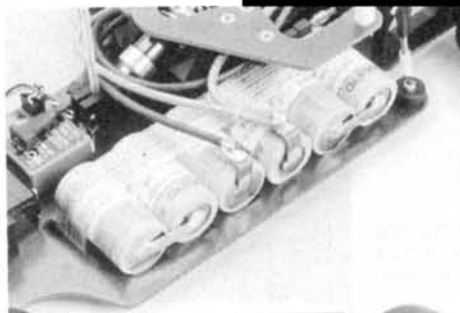
Up front, there's a split front crossbar, so caster can be adjusted independently on each front wheel.

The small Delta shock has been replaced by a thicker purple shock, which increases travel and smooths damping. The rear of the upper shock brace has been extended so that

the body posts can be mounted on it instead of on the chassis. Posts mounted on the shock brace can be shorter and stiffer, and this helps to reduce chatter. In the rear, a new lower rear pod plate with a kick-up prevents the spurs from being destroyed in rear-end collisions.



*The Lynx II SS has a fully floating rear pod with a coil-over oil-filled shock and a rear roll bar. The Lynx II SS also uses a small silicone damper to slow the pod's lateral movements.*



*Above: the Lynx II SS is great for oval racing because all the cell slots are on the left side. Note the extended shock bridge to which the body mounts are attached.*

## Lynx II SS

Manufacturer ..... TRC/Composite Craft  
Price ..... \$349.95

### DIMENSIONS:

Overall Length ..... 19 inches  
Width ..... 8 inches  
Wheelbase ..... 10.5 inches  
Front Track ..... 6.75 inches  
Rear Track ..... 6.5 inches

### WEIGHT:

Gross (w/bat.) ..... 43.12 ounces

### BODY:

Type ..... Not included

### CHASSIS:

Type ..... Pan  
Material ..... Graphite

### DRIVE TRAIN:

Primary ..... Pinion/spur  
Transmission ..... Direct drive  
Differential ..... Ball  
Bearings/Bushings ..... Ball bearings

### SUSPENSION:

Front: Type ..... Floating kingpin  
Damping ..... Coil spring  
Rear: Type ..... Full floating rear pod  
Damping ..... Oil-filled, coil-over shock

### WHEELS:

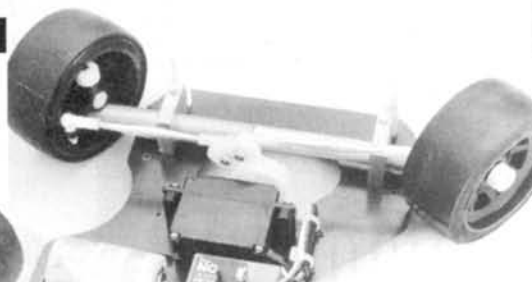
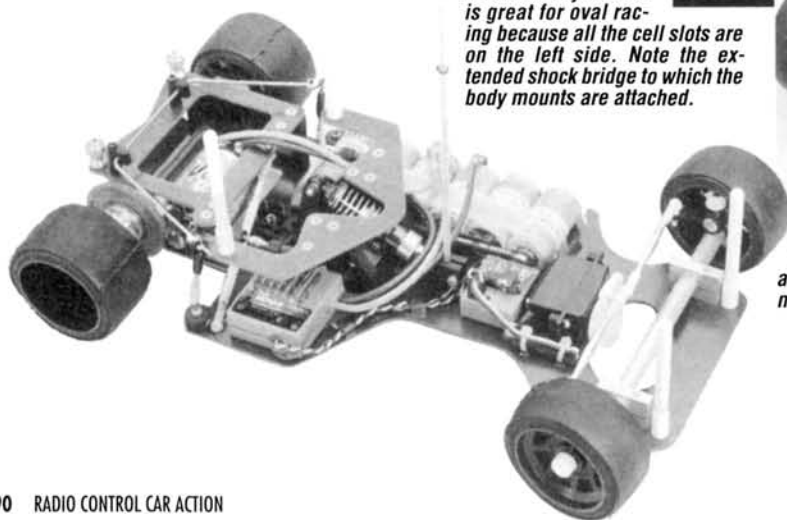
Front: Type ..... Composite NASCAR style  
Dimensions (DxW) ..... 1.75x1 inches  
Rear: Type ..... Composite NASCAR style  
Dimensions (DxW) ..... 1.75x1.5 inches

### TIRES:

Front/Rear ..... Staggered radials

### ELECTRICS:

Motor ..... Not included  
Battery ..... 6-cell stick pack\*  
Speed Controller ..... Not included  
\* not included



*Above: a magnesium split-front crossbar allows caster to be adjusted independently for each wheel. In-line front axles help minimize steering scrub.*

SUPER  
SPEED  
WAY

# Roundup

## Cobra SS

Manufacturer ..... C&M Manufacturing  
Price ..... \$254.95

### DIMENSIONS:

Overall Length ..... 18.5 inches  
Width ..... 7.75 inches  
Wheelbase ..... 10.75 inches  
Front Track ..... 6.375 inches  
Rear Track ..... 6.375 inches

### WEIGHT:

Gross (w/bat.) ..... 41 ounces

### BODY:

Type ..... Not included

### CHASSIS:

Type ..... Pan  
Material ..... Graphite

### DRIVE TRAIN:

Primary ..... Pinion/spur  
Transmission ..... Direct drive  
Differential ..... Ball  
Bearings/Bushings ..... Ball bearings

### SUSPENSION:

Front: Type ..... Floating front axle  
Damping ..... None  
Rear: Type ..... T-plate with rocker balls  
Damping ..... Fuel tubing

### WHEELS:

Front/Rear ..... Not included

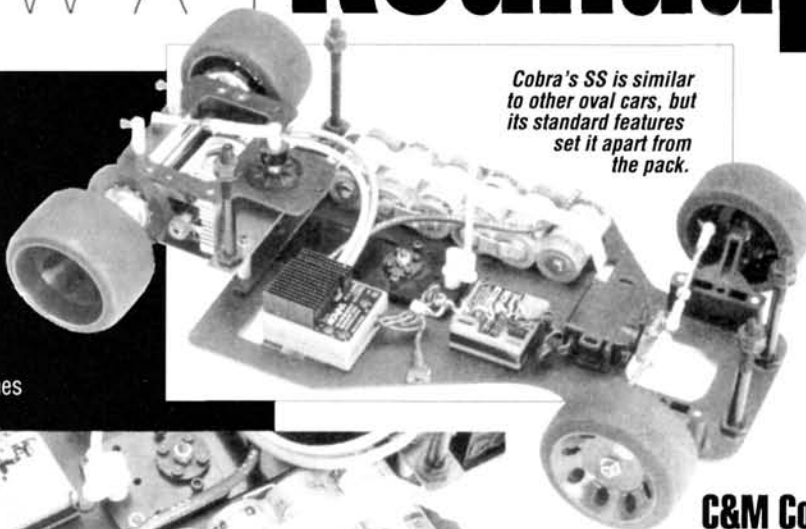
### TIRES:

Front/Rear ..... Not included

### ELECTRICS:

Motor ..... Not included  
Battery ..... 6-cell stick pack\*  
Speed Controller ..... Not included  
\*not included

Left: the SS has a nylon-block front end for simplicity and strength. Titanium rods are standard equipment.



Cobra's SS is similar to other oval cars, but its standard features set it apart from the pack.

## C&M Cobra SS

C&M Mfg.\* has been in the pan-car business for a long time, so it knows what works. Its latest version of the successful Cobra is the Cobra SS, which is crafted of high-quality materials and is ready to race, right out of the box.

The SS has a super-flat, 100-percent-graphite chassis; full ball bearings; an aluminum-heat-sink motor mount; aluminum hubs; a Velvet Drive, five-ball-bearing pro diff; a titanium axle and turn-buckles; and a set of wing mounts that actually work! All the parts in the kit are of the highest quality, and tolerances are very tight. There's no need to buy the usual add-ons;

they're stock with the SS!

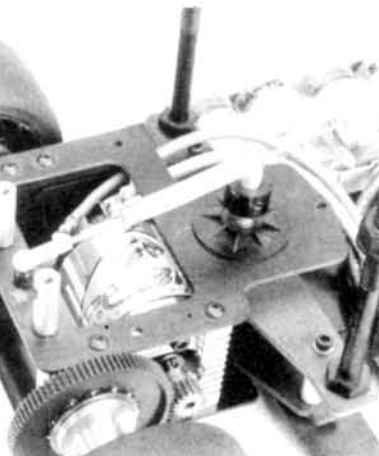
The SS's layout looks very simple, but don't be fooled; this is a totally "race-tunable" machine. Its simple layout helps racers dial-in to the track quickly and easily. Its suspension consists of a floating-kingpin front end with adjustable caster, camber and toe-in. The rear suspension is of the

T-plate variety, and it has two pivot balls, pressure plates and an ultralight friction damper. C&M will soon release a quick-change conversion that will allow racers to change batteries in less than 2 seconds.

With wins in the Modified Class at Thunderdrome and the U.S. Oval Masters at Lake Whippoorwill, the SS has proven itself to be a thoroughbred racing machine.

Above: to keep handling well-balanced, the SS has its battery more toward the center of the car than other oval cars do.

A simple, light, fuel-tube damper is used with a T-plate and pressure disks to keep the rear end hooked up. A titanium axle and a heat-sink motor mount are standard.





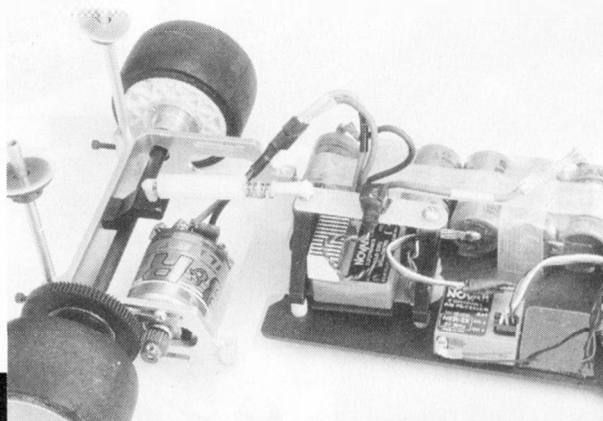
SUPER  
SPEED  
WAY

# Roundup

## ster OO

ster\* is on the move! Having started with bodies, ster has now successfully branched off into car with the inexpensive Outlaw, the company offered at was not only inexpensive but also simple for beginners to build and set up. With the MX-icAllister moved up to the competition level, but it ie low price that had made the Outlaw such a suc- With the OO (Oval Only), McAllister has a full-acing machine. It seems to look like every other n the market, but it warrants a closer inspection. graphite chassis is attached to a simple beam front and front caster is adjustable. The rear suspension standard T-plate and coil-over shock. The old S principle (Keep It Simple, Stupid!) seems to be the to the car's success. Don't let this comparatively ble car fool you; all of its features have been well-ight-out. A small slot has been cut in the chassis to ommodate a larger servo saver, and the end has been stiffened with a small

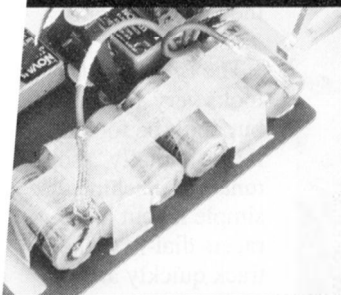
piece of fiberglass, so the suspension can work to its full potential. When you're looking for a new oval car, remember that the designs of most of the cars available are very similar, but small differences set them apart in performance. Advances like the narrow car come along very rarely and, when they do, you can bet that everyone will have his own twist.



*Above: the OO's rear end uses a T-plate with a small damper to control pod movement. Note that the pod is slotted to use either gears or a belt drive.*

*Below: a standard beam front end keeps things simple, and there's a cutout for the servo-saver.*

*low: OO stands for "Oval Only"; all the cells are mounted on the left.*



*The simple design of McAllister's OO minimizes racer frustration.*

## OO (Oval Only)

Manufacturer ..... McAllister  
Price ..... \$249.95

### DIMENSIONS:

Overall Length ..... 14.25 inches  
Width ..... 8.75 inches  
Wheelbase ..... 10.25 inches  
Front Track ..... 8 inches  
Rear Track ..... 8.75 inches

### WEIGHT:

Gross (w/bat.) ..... 42 ounces

### BODY:

Type ..... Not included

### CHASSIS:

Type ..... Pan  
Material ..... Graphite

### DRIVE TRAIN:

Primary ..... Pinion/spur  
Transmission ..... Direct drive  
Differential ..... Ball  
Bearings/Bushings ..... Ball bearings

### SUSPENSION:

Front: Type ..... Kingpin  
Damping ..... Coil spring  
Rear: Type ..... T-plate  
Damping ..... Shock

### WHEELS:

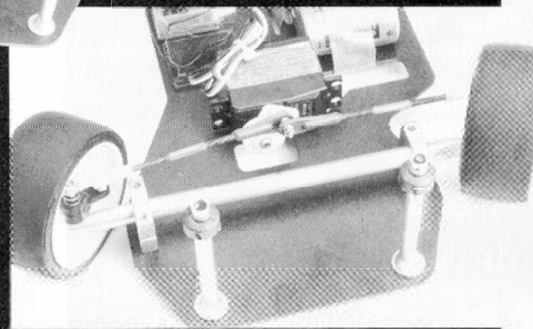
Front/Rear ..... Not included

### TIRES:

Front/Rear ..... Not included

### ELECTRICS:

Motor ..... Not included  
Battery ..... 6-cell pack\*  
Speed Controller ..... Not included  
\*not included



93



SUPER  
SPEED  
WAY

# Roundup

## Bolink LTO SS

If any company can claim to have started  $1/10$ -scale on-road racing, it's Bolink\*. Its Eliminator 10 was the first truly  $1/10$ -scale racing car, and Bolink has constantly improved its performance and durability with a steady stream of after-market parts. After the Eliminator came the LTO—a highly modified Eliminator that was set up for oval racing. With the narrow-car craze sweeping the nation, Bolink has jumped on the bandwagon with a narrower, improved version of its LTO. What makes this new version different from the other?—a narrow graphite chassis and an aluminum rear pod. Suspension consists of a floating-axle setup that's attached to a graphite front crossbar. Rear suspension consists of two small oil-filled shocks, a lateral tube damper and a flexible T-plate. The uncomplicated design is easy to set up and to work on. The LTO SS has shown itself to be a fierce competitor across the nation; in the deft hands of Terry Rott, it won the ROAR Oval Championships! Nuff said!

\*Here are the addresses of the companies featured in this article:

**Team Associated**, 3585 Cadillac Ave., Costa Mesa, CA 92626.

**Advanced Racing Technology**, 460 Cypress Ln., Suite F, El Cajon, CA 92020.

**TRC/Composite Craft**, P.O. Box 1058, Albemarle, NC 28001.

**C&M Mfg.**, P.O. Box 701-353, Nest Valley City, UT 84170.

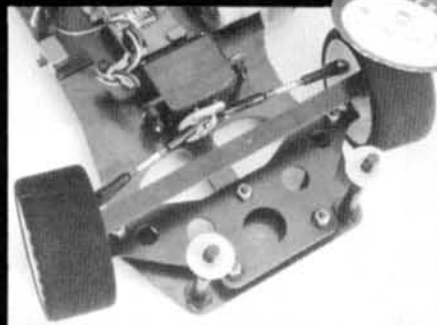
**Hyperdrive**, 3201 Howard Nickell Rd., Fayetteville, AR 72703.

**Bolink R/C Cars Inc.**, 420 Hosea Rd., Lawrenceville, GA 30245.

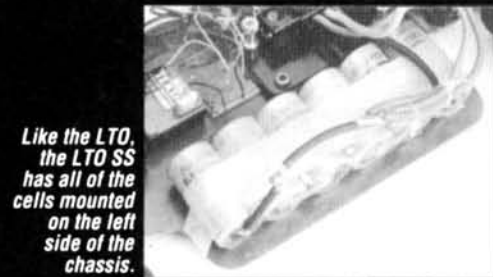
**McAllister Racing**, 1000 N. Humphreys St., Suite 204, Flagstaff, AZ 86001.



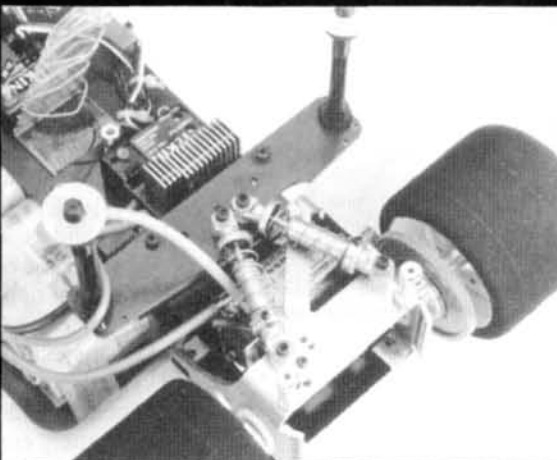
The Bolink LTO SS is similar to the standard LTO, but it has a narrower profile.



The LTO SS's front end uses a simple graphite plate and an upper brace to sandwich the kingpins and front axles.



Like the LTO, the LTO SS has all of the cells mounted on the left side of the chassis.



A new, narrow, Alluma-lite rear pod keeps the rear axle aligned correctly and keeps motor temperature down. The two rear shocks have a variety of mounting holes to suit any kind of track.

## LTO SS

Manufacturer ..... Bolink  
Price ..... \$269.95

### DIMENSIONS:

Overall Length ..... 13.5 inches  
Width ..... 8 inches  
Wheelbase ..... 10.125 inches  
Front Track ..... 7.5 inches  
Rear Track ..... 8 inches

### WEIGHT:

Gross (w/bat.) ..... 41 ounces

### BODY:

Type ..... Pontiac Grand Prix  
Material ..... Polycarbonate

### CHASSIS:

Type ..... Pan  
Material ..... Graphite

### DRIVE TRAIN:

Primary ..... Pinion/spur  
Transmission ..... Direct drive  
Differential ..... Ball  
Bearings/Bushings ..... Ball bearings

### SUSPENSION:

Front: Type ..... Kingpin  
Damping ..... Coil-spring  
Rear: Type ..... T-plate  
Damping ..... Dual oil-filled shocks

### WHEELS:

Front: Type ..... 1-piece plastic  
Dimensions (DxW) ..... 2.125x  
1.1875 inches  
Rear: Type ..... 1-piece plastic  
Dimensions (DxW) ..... 2.5x1.5  
inches

### TIRES:

Front ..... Blue foam  
Rear ..... Green foam

### ELECTRICS:

Motor ..... Not included  
Battery ..... 6-cell pack\*  
Speed Controller ..... Not included  
\*not included

**A** MILLION YEARS ago, cavemen must have stared with wonder and jealousy at birds as they flew by. That birds could easily fly across a valley that would take a caveman hours or days to cross must have been very frustrating to our ancestors.

In the 15th century, humans were smarter. Leonardo da Vinci put wings on sticks to make the world's first model airplanes. Though he was obviously a genius, many thought he was crazy.

The big breakthrough in flying came in the first years of this century. To study wings, two brothers from Ohio made a wind tunnel—a big tube with a fan that sucked air through it. By positioning a wing in the tube and watching it through a little window, they figured out how it worked. With that knowledge and a lot of hard work, the Wright brothers built an airplane. It's a fact—wings work!—but not just for flying.

Early on-road auto racers knew this, and they occasionally put vertical wings on their car rears to help keep the cars moving straight at high speeds. Unfortunately, when hit with a strong crosswind, these cars would occasionally go racing off the road, usually being wrecked as they did so.

Then, about 30 years ago, some Goodyear tire researchers who were tinkering in their laboratory discovered something important! Increasing a tire's weight increases its traction much more than its friction. In other words, pushing down on a wheel gives it a lot more bite without really slowing it down much.

German engineers at Mercedes-Benz heard about this. Wily men that they were, they placed a wing atop their racing car and started blowing away the competition. The tires "experienced" more weight than the actual weight of the car. As a

result, they had more bite, especially while braking and cornering at high speeds.

Basically, a wing is an aerodynamic device, and when used on a car, it creates downforce. A wing cross-section can be shaped like a teardrop (an airfoil), or the wing can be made out of a flat sheet. These will be referred to as airfoil wings and flat wings.

Now, Indy cars and Formula 1 cars show state-of-the-art wing use. At high speeds, wings can *triple* the weight that's put on the tires! The same applies to on-road R/C cars; the key is having a good wing in the correct position.

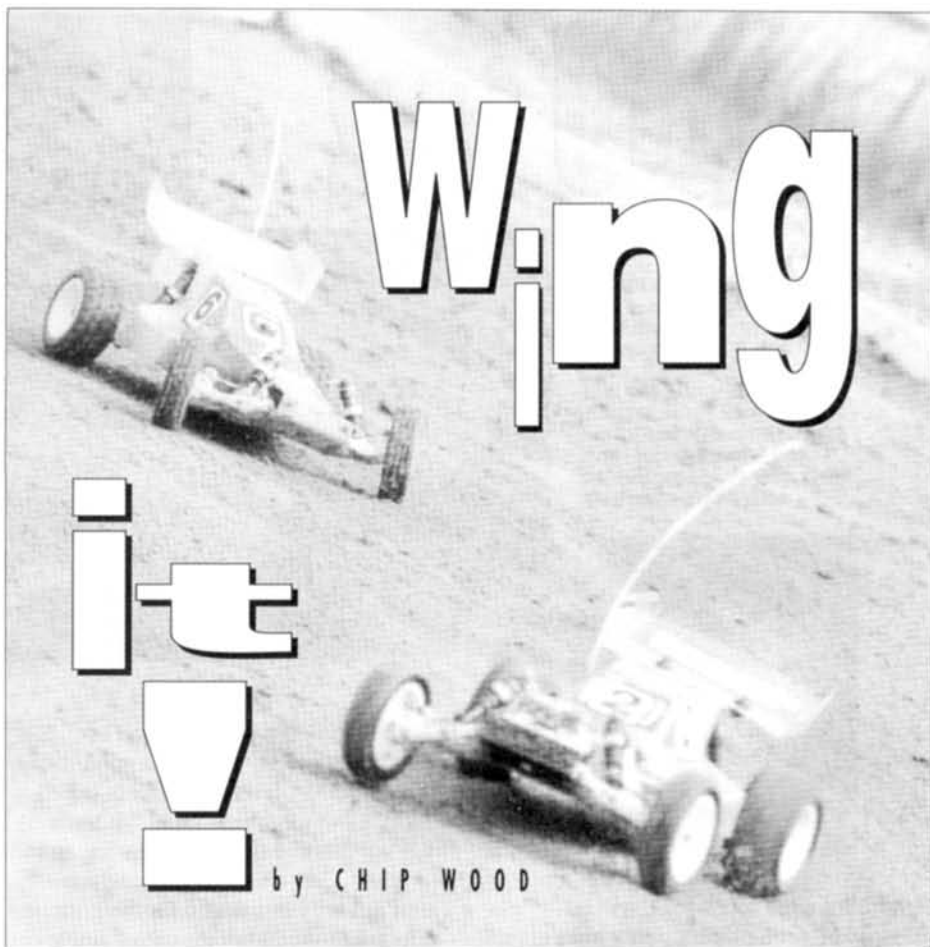
Several wings can be used together to create greater downforce. On Indy cars, the wings are actually made of one main unit with several smaller ones behind it. Each wing is at a steeper angle than the one in front of it. This design can push a huge volume of air. If you've ever seen Formula 1 cars racing in the rain, you've seen them blow incred-

ible wedges of mist and air high above and behind them. Pushing up all that air forces the car down.

A wing should be in the "cleanest" or least disturbed air. When a car moves, it creates many little eddies, currents and miniature cyclones in the air around and behind it. A wing set in these unstable air currents will probably be of little help. A wing that's above the car in clean air, however, will function correctly, but one that's too high might be against the rules of some racing organizations.

Wings work because they're set at an angle. Generally, the greater the angle, the greater the downforce. Unfortunately, the greater the angle, the greater the drag, too. Generally, the wings on R/C cars don't need more than 15 to 20 degrees of kick-up. Off-road cars, in which rear-end drag can be used as a stabilizing force, might be the exceptions.

Wings must always be clean. A dirty or rough surface will encounter more drag and produce less downforce. For example, pilots of high-performance light aircraft try to keep the planes' wings clean and highly polished. Dead bugs, especially on the wings' leading edges



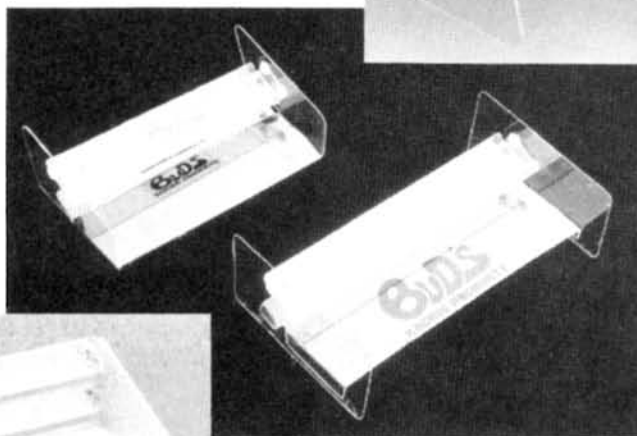
DOWNFORCE

DILEMMA



# wing it!

Here are some wings that you can find in hobby shops: Bud's\* bi-level wings (right) are available in several sizes and configurations; CRP's Aero Wing (below) has a functional airfoil and two smaller ones; Tecnacraft's Aerofoil (top right) is the wing that I think offers more downforce than any other single-plane wing.



(the front edge of a wing), will adversely affect a plane's performance.

## WHICH WING?

I think the best wing on the market is the Tecnacraft\* Aerofoil. It's a true airfoil wing; it offers more downforce and less drag than any other wing available. It's most effective in on-road racing, where its excellent downforce-to-drag

ratio is put to good use.

CRP\* makes a good tri-level airfoil wing called the "Aero Wing." It has a functional airfoil wing and two smaller ones, which

aren't exactly positioned for the greatest effect. ROAR allows the use of single or bi-level wings, but this wing can be made ROAR-legal by removing one of the two smaller airfoil wings.

Most R/C car wings are made of flat or curved plastic sheet. Flat wings work reasonably well, but the drag they encounter is generally greater than that encountered by true airfoil wings. (This drag isn't really significant, except perhaps in high-speed, on-road racing where a car must have lots of rear downforce.) Flat wings do work

though, and they weigh less and are easier to use than true airfoils.

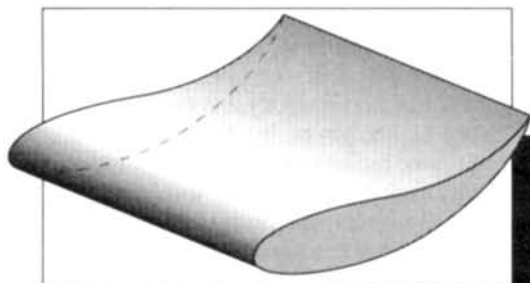
Though not true wings, spoilers offer similar benefits. They produce significant downforce, and the high degree of drag they encounter can help stabilize the rear of the car. Monster trucks can often benefit from the use of spoilers, especially on tracks with big tricky jumps.

The benefits provided by the wing side dams (vertical stabilizers) aren't often even considered. They can be useful in stabilizing cars traveling at high speeds. If the trailing edges of the side dams are bent outward, the car's tail will be held more in line on the straightaways (see diagram). This will allow you to set up a car "loosely," i.e., with less rear traction, for the "slow" corners, because the side dams will increase the car's stability on the straightaways.

At the recent 2WD Off-Road World Championships, I watched a car driven by Masami Hirosaka occasionally become too "loose" in the straights, and I couldn't help but think that he could have benefited from the use of aerodynamics theory. He won anyway, and that brings up an important point: no matter how fantastic the wing, it's the driver that counts. You!

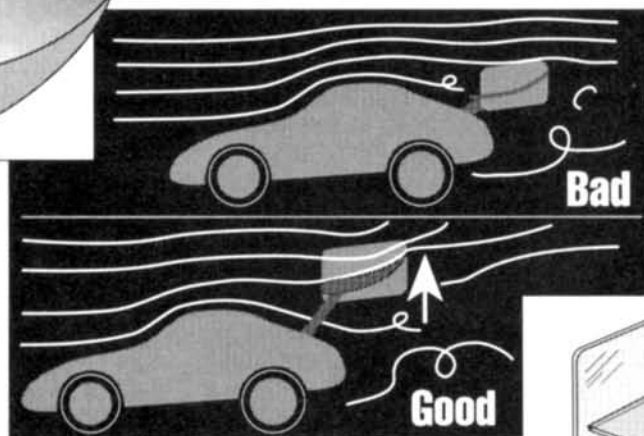
Oh—one other thing: I also like wings because my cars just wouldn't look right without them. Know what I mean?

\*Here are the addresses of the companies mentioned in this article:  
**Tecnacraft**, 1335B Dayton St., Salinas, CA 93901.  
**CRP**, 8784 Plata Ln., Atascadero, CA 93422.  
**Bud's Racing Products**, 1575 Lowell St., Elyria, OH 44035.

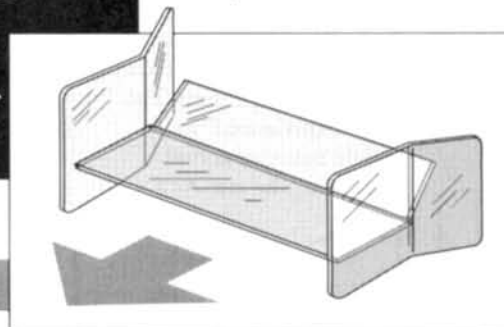


▲ For a wing to be its most effective, its cross-section should be shaped like an elongated teardrop. This design produces more downforce and less drag than a flat wing of a similar size.

► A wing works best if it's in the "cleanest," or least disturbed, air. If it's mounted too close to the car's body, it will be affected by the air currents that the body produces.



► Wing side dams help to stabilize cars traveling at high speeds.



# Track Directory

YOUR 1992 TRACK GUIDE

## ALABAMA

"Lil" TST R/C Raceway, 32 St. N., Alabama City, AL 35904; (205) 547-0072



R/C Hi-Tech Raceway, 3303 Meridian St., Huntsville, AL 35811; Rick Chambers, (205) 539-1347



## ALASKA

ARCORR, Fairbanks St., Anchorage, AK 99507; Leon Fahrenthold, (907) 349-1950 (evenings)



McKinley Hobby & Raceway, 2300 McKinley Dr., Wasilla, AK 99654; (907) 376-9351



## ARIZONA

R/C Sports Mania, 3550 N. 35th Ave., Phoenix, AZ 85028; (602) 272-3165



Scale Racing Sports, 1120 N. Hayden Rd., Tempe, AZ 85281; Mike Dolan, (602) 829-9117



## ARKANSAS

AERCC, Vimy Ridge Rd., Little Rock, AR; (501) 945-7037



Arkansas Int'l. Superspeedway, Rt. 4, Stokes Rd., Pine Bluff, AR 71602; (501) 247-1488



R-C Wheelz, 2630 Piko Ave., N. Little Rock, AR 72114; (501) 758-3330



## CALIFORNIA

California Auto Racers (CAR), 96 San Tomas Aquino Rd., Campbell, CA 95008; (408) 749-9751



City Speedway, 7750 Convoy Ct., San Diego, CA 92111; (619) 560-9633



Desert R/C Raceway, 39360 3rd St. E., Suite 305, Palmdale, CA 93550; (805) 272-1835



Fast Eddie's R/C Raceway, 3261 Edward Ave., Santa Clara, CA 95054; (408) 986-8256



Fast Lane, 25845 San Fernando Rd., #21, Saugus, CA 91350; (805) 255-2404



Frogtown R/C Raceway, Motherlode Hobbies, 3069 Hwy. 49, Angels Camp, CA 95222; (209) 736-4989



Hobbyscrafters Raceway, 323 Five Cities Dr., Pismo Beach, CA 93449; (805) 773-6765



Jackman's R/C Raceway, 1616 N. Beale Rd., Marysville, CA 95901; Bonnie or Harry Jackman, (916) 741-3744



K&M R/C Raceway, 22474 A Barton Rd., Grand Terrace, CA 92324; Mike Blake, (714) 783-0899



Lindsey's R/C Raceway, P.O. Box 443, Doyle, CA 96109; (916) 827-2457



Matt Norris' Fast Track, 8354 Marina Greens, Sacramento, CA 95826; (916) 381-0931



One-Stop Raceway, 3782 Cerritos Ave., Los Alamitos, CA 90720; (213) 493-7597



Paso Robles R/C, P.O. Box 3795 (3980 Linne Rd.), Paso Robles, CA 93447; (805) 237-0624



The Race Place, 13564 E. Imperial Hwy. Unit G, Santa Fe Springs, CA 90670; (213) 926-7711



Radio-Controlled Hobbies, 2011 Placentia Ave., Costa Mesa, CA 92630; (714) 631-1555



R/C Sports, 1009 Alamo Dr., Vacaville, CA 95688; (707) 446-5555



R/C World, 5759 E. Fountain Way, Suite 101, Fresno, CA 93727; (209) 348-9409



Robin's Racing World, 1844 W. Glenoaks, Glendale, CA 91201; (818) 240-2093



Roy's Raceway, 368 E. 11th St., Tracy, CA 95516; (209) 836-3513



San Diego R/C Car Club, P.O. Box 232456, San Diego, CA 92193; (619) 560-0089



SRS Raceway, 915 N. Main St., Salinas, CA 93906; (408) 424-4044



Trains, Planes, Automobiles, 1260 Oddstad, Redwood City, CA 94062; (415) 365-7500



Tyler's RC/RD Racing Center, 6865 Flanders #D, San Diego, CA 92121; (619) 597-3072



Woodbridge R/C Speedway, Irvine, CA. Contact Dave Anderson, (714) 551-5007



Yorba Linda R/C Speedway, 3780 Prospect #B, Yorba Linda, CA 92686; David Landier, (714) 572-2175



## KEY TO SYMBOLS

- Indoor
- Outdoor
- Off-road
- Oval
- Dirt oval
- Carpet
- Concrete
- Asphalt
- On-site hobby shop
- AC power
- Automatic lap-counting
- Food available



# Track Directory

## COLORADO

**Action R/C Raceway**, 4939 N. Broadway #57, Boulder, CO 80304; (303) 440-0330



**Colorado R/C Speedway**, 6520 Wadsworth Blvd. #130, Arvada, CO 80003; (303) 425-1718



**Edora Park R/C Speedway**, Edora Park, Ft. Collins, CO 80524; (303) 482-0197



**Hot Lap Hobbies & Raceway**, 4206 Wadsworth, Wheat Ridge, CO 80034; Phil Cotter, (302) 420-3051



**MHOR R/C Raceway**, 15540 E. Batavia Dr., Aurora, CO 80011; (303) 343-0151



**R/C World & Track**, 2788 S. Federal Blvd., Denver, CO 80236; (303) 789-0838



## CONNECTICUT

**Connecticut R/C Off-Roads**, Old Field School, Mona Terrace, Fairfield, CT 06430; (203) 661-0145



**High-Tech Raceway**, 374 Enfield St., Enfield, CT 06082; (203) 745-8488



**Hobby World Raceways**, 161-6 Woodford Ave., Plainville, CT 06062; (203) 793-1111



**K/N R/C Speedway Inc.**, West St., Stafford Springs, CT 06076; (203) 684-9896



**R/C Madness**, 640 Enfield St., P.O. Box 64, Enfield, CT 06082; Christopher Marcy, (203) 741-6501



**R/C Raceways Inc.**, 1265 John Fitch Blvd., South Windsor, CT 06074; (203) 528-3661



**R/C World/Sugar Hollow Speedway**, 66 Sugar Hollow Rd., Danbury, CT 06810; (203) 748-2185



**Wallingford Indoor Racing**, 63 N. Cherry St., Wallingford, CT 06492; (203) 265-3939



## DELAWARE

**TNT Raceway**, Alt 13 South, Seaford, DE 19973; (302) 628-0520



## FLORIDA

**5-fifty-5 Raceway**, County Rd. 555, Bartow, FL 33830; Chuck Nolke, (813) 324-7406



**B+T R/C Central**, 811 Playground Rd., Fort Walton Beach, FL 32547; (904) 863-2666



**Branford R/C Speedway**, Rt. 3, Box 240, Branford, FL 32008; (904) 935-0758



**Continental Racing**, 5335 N. Military Trail, West Palm Beach, FL 33407; (409) 697-5167



**Coral Springs Roadrunners**, P.O. Box 9632, Coral Springs, FL 33075; Tom Allison, (305) 721-0344 or Rick Schwartz, (305) 344-1983



**H&H Raceway**, 4121 S. Tamiami Tr., Sarasota, FL 34231; (813) 922-7711



**Hialeah Hobby Raceway**, 4562 W. 12 Ave., Hialeah, FL 33015; (305) 826-3702



**JARCAR/Hobby World**, 7273 103rd St., Jacksonville, FL 32210; (904) 772-9022



**Lake Whipoorwill International Speedway**, 12345 Narcoossee Rd., Orlando, FL 32827; Bob Hosch, (407) 277-9586; fax (904) 759-3993



**Lou's R/C Hobbies & Raceway**, 1512 SE Village Green Dr., Port St. Lucie, FL 34952; (407) 337-9000



**M&M R/C Raceway**, 16921 Waterline Rd., Bradenton, FL 34202; Mike Williams, (813) 747-2889



**PBG R/C Motor Park**, 4399 Lilac St., Palm Beach Gardens, FL 33410; (407) 524-9252



**Pro Hobbies Speedway**, 715 N. Lake Pleasant Rd., Apopka, FL 32712; (407) 886-4615



**Raceway Hobbies**, 1115-J Enterprise Ct., Holly Hill, FL 32117; (904) 258-7537



**Ray's Track & Hobby**, 4605 W. Cayuga St., Tampa, FL 33614; (813) 872-8662



**Rental Raceway**, 3655 S. Hopkins Ave., Titusville, FL 32780; (407) 383-0631



**St. Augustine R/C Speedway**, 99 Masters Dr., St. Augustine, FL 32095; (904) 824-6357



**Sun Valley Speedway**, Palmer Blvd., Sarasota, FL 34232; (813) 322-1200; (mailing address: Rt. 1, Box 443N, Myakka City, FL 34251)



**West Coast R/C Club**, Lake Park, 8607 May Cr., Tampa, FL 33614; (813) 932-3650



**Wilbur Avenue Raceway**, 1848 Wilbur Ave., Vero Beach, FL 32960; (407) 567-1200



## GEORGIA

**Case R/C Raceway**, P.O. Box 1061, Trenton, GA 30752; (404) 657-6789



**Dalton Raceway**, 2300 Chattahoochee Rd., Dalton, GA 30720; (404) 226-6699



**Georgia Hobby Center**, 112 Kenwood Rd., Fayetteville, GA 30214; (404) 460-1753



**Good Life City Raceway**, 6606 Newton Rd., Albany, GA 31707; (912) 888-2515



**Peach Bowl R/C Speedway**, 2035 Westside Ct., Snellville, GA 30278; (404) 985-1448



**The Racer's Edge**, 1530 Hwy. 19 North, Thomaston, GA 30286; Mark or Roger Walls, (404) 648-6534



**Sandy Cross Speedway**, Rt. 1, Box 1073, Royston, GA 30662; Morris Phillips or Wayne Fowler, (404) 245-9573



**Silver Wings Raceway**, 5611 Riverdale Rd., College Park, GA 30349; (404) 991-2225



## IDAHO

**Falls Hobbies & R/C Raceway**, 1515 Northgate Mile, Idaho Falls, ID 83401; (208) 529-8650



## ILLINOIS

**Ameri-Trac**, R3, Box 242, Mattoon, IL 61938; (217) 234-8707



**Badlands II**, 320 W. Jackson St., Vandalia, IL 62471; (618) 283-2913



**B.A.R.R.**, 809 River Dr., Byron, IL 61010; Jim Haynes, (815) 234-5615



**Eagle Speedway**, 303 N. Plum St., Pontiac, IL 61764; (815) 842-1738



**Hobby Town Raceway**, 4915 W. Rt. 120, McHenry, IL 60050; Mike Hollingsworth (815) 344-1777



**JC Hobbies/Metro Motor Speedway**, Metropolis Airport, Metropolis, IL 62960; (618) 524-9979



**JMP Raceway**, 952 Harrison Ave., Wood River, IL 62095; (618) 258-0297 or -0282



**Leisure Hours Hobbies**, 2872 Plainfield Rd., Joliet, IL 60435; (815) 439-1477



**Lisle Community Park Raceway**, 1825 Short St., Lisle, IL 60532; (708) 416-6944 (Jim Bernicky)



**Machesney Park**, 1220 Shappert Dr., Machesney Park, IL 61111; (815) 282-1311



**Magnum R/C Speedway**, RR#2, Box 399, Danville, IL 61832; Terry & Nancy Dines, (217) 446-2472



**Monee R/C Raceway**, 26049 Ridgeland Ave., Monee, IL 60449; (708) 534-2422



**R/C Speed Zone**, 1400 E. Lafayette, Bloomington, IL 61701; (309) 662-RACE



**Redline Raceway**, 921 Harding, Calumet City, IL 60409; (708) 862-8181



**SIRCAR Raceway**, 1200 North Marion, Carbondale, IL 62901; (618) 549-5885



**Slot Wing Hobbies Race Place**, 1615 W. Springfield, Champaign, IL 61821; (217) 359-1920



**Smithton Community Park**, P.O. Box 8152, Belleville, IL 62221; (618) 236-7569



**Superior Raceway**, 1706 W. Bradley, Champaign, IL 61821; (217) 359-8073



**Thunderroad Speedway**, 5 W. Division St., Coal City, IL 60416; A. Cooley, (815) 634-8184



**Valley Farms R/C Raceway**, 706 By-pass 20, Cherry Valley, IL 61016; (815) 332-4516



## INDIANA

**BJ's Riverside Raceway**, 265 S. Clay St., Jasper, IN 47546; Joe Lorey, (812) 482-3484



**Blaze'n Race'n**, P.O. Box 6, Hamlet, IN 46532; James Berndt, (219) 867-1324



**Boone County R/C Track**, 1300 E. 100 S. Rd., Lebanon, IN 46052; Jerri Moss, (317) 293-2225



**CC Hobby & Speedway**, RR 1, Box 68, Francesville, IN 47946; (219) 567-2447



**Gonzo Raceway**, 418 Roberts Rd., Chesterton, IN 46304; (219) 980-8409



**Hobby Barn Raceway**, 1950 Springhill, Terre Haute, IN 47802-9694; (812) 299-5773



**K&L Hobbies**, 7 Raceway, 2751 N. State Rd. 39, La Porte, IN 46350; (219) 324-0353



**Mooresville R/C Hobby**, 7 Moore St., Mooresville, IN 46158; (317) 831-8877



**Mooresville R/C Hobby**, 9201 S. State Rd. 67, Camby, IN 46113; (317) 831-8877



**PITT**, 1244E 700N, Ossian, IN 46777; (219) 622-4591



**R/C World of Indiana**, RR #2, Box 335, Lynn, IN 47355; (317) 874-2464



**Radio Car Craft**, 1925 S. Curry Pike, Bloomington, IN 47403; (812) 332-3245



## IOWA

**Mr. Car Raceway**, Central Iowa Fairgrounds, Marshalltown, IA 50158; (515) 483-2234



**North Park R/C Speedway**, 805 S. Jerome, Algona, IA 50511; (515) 295-9352



**Plymouth County R/C Speedway**, 4th Ave. NE (Plymouth County Fairgrounds), LeMars, IA 51031; (712) 546-8788 or -9522



**Power House Racing**, 1200 S. Division St., Creston, IA 50801; (515) 782-4582 or 782-4174



**Rotunda Raceway**, 101 Bass, RR 1 Box 155A, Storm Lake, IA 50588; (712) 732-4555



**Sibley Raceway**, Osceola County Fairgrounds, Sibley, IA 51249; Al Reck (712) 754-2604 (day) or 754-3613 (night)



**Southwest Iowa R/C Raceway**, Kelly Park, Red Oak, IA 51566; (712) 623-5513



## KEY TO SYMBOLS

- Indoor
- Outdoor
- Off-road
- Oval
- Dirt oval
- Carpet
- Concrete
- Asphalt
- On-site hobby shop
- AC power
- Automatic lap-counting
- Food available



# Track Directory

**Southwest Iowa R/C Raceway**, Montgomery County Fairgrounds, Red Oak, IA 51566; (712) 623-5513



**Team Johnson Speedway**, Jct. Hwy. 34 & 406, West Burlington, IA 52655; (319) 753-0753



## KANSAS

**Chad's R/C World & Raceway**, 217 Brownie Ave., P.O. Box 76, Scranton, KS 66537; (913) 793-2313



**Pittsburg International Mini Speedway**, 511 1/2 N. Locust, Pittsburg, KS 66762; (316) 232-1973



**R/C Superdome & TQ Pro Shop**, 14 East Avenue A, Hutchinson, KS 67501; (316) 665-6633



**Spring Creek Raceway**, 7257 W. Cloud St., Salina, KS 67401; (913) 823-8992



## KENTUCKY

**Bluegrass Int'l/Perry's R/C Hobbies**, 214 Globe St., Radcliff, KY 40160; William Perry, (502) 351-RACE



**Fast Lane Hobbies**, 6132 Scottsville Rd., Bowling Green, KY 42104; (502) 782-2419



**The Lexington Autodrome Raceway**, 2753 Richmond Rd., Lexington, KY 40509; (606) 269-7794



**Remote-Control Hobby Shop/Raceways**, Rt. 8, Box 211, Mayfield, KY 42066; (502) 247-4715



## LOUISIANA

**Acadiana R/C Hobbies & Raceway**, 120 Toledo Dr., Lafayette, LA 70506; (318) 235-5825



**Cajun R/C Raceway**, Rt. 2, Box 288 Hwy. 343, Church Point, LA 70525; (318) 873-3855



**The Hobby Shop Track**, 110A Darbonne, Sulphur, LA 70663; (318) 527-9129



**Oakdale Raceway**, 1259 Hwy. 165 S., Oakdale, LA 71463; M.L. Jeziorski, (318) 335-3532



## MAINE

**Central Maine R/C Speedway**, 18 Lithgow St., Winslow, ME, 04901; David Prescott, (207) 877-2232



**Rocket R/C Hobbies**, Annabessacook Rd., Winthrop, ME 04364; (207) 377-6910



**Team Terminator Off-Road Track**, c/o Hobbies Plus, 479C Elm St., Biddeford, ME 04005; (207) 282-8838



**The Racers' Club**, 85 Hubbard Rd., P.O. Box 160, Berwick, ME 03901; (207) 698-5337



## MARYLAND

**Cliff's R/C Raceway**, 4727 Conowingo Rd., Darlington, MD 21034; Doug, (301) 538-3135



**Doug's Hobby Shop Raceway**, Rt. 301N, Box 32B, Waldorf, MD 20601; (301) 843-7774



**Friendship Off-Road Racers**, 1531 Florida Ave., Severn, MD 21144; (301) 551-3050



**GPA Speedway**, 3498 Crain Hwy., Bowie, MD 20715; George Cole, (301) 805-9004



**Off-Road Headquarters Indoor Raceway**, 5640 K Sunnyside Ave., Beltsville, MD 20705; (301) 474-1246



**Suzie Goose Hobbies**, 718 E. Gude Dr., Rockville, MD 20850; (301) 279-2966



## MASSACHUSETTS

**Archer's Lane R/C Raceway**, 11B Washington St. (Rt. 1), S. Attleboro, MA 02730; (508) 399-6762



**CKS Raceway**, 46 Wilbraham St., Palmer, MA 01069; (413) 283-2260



**Megadrome Raceway**, North Adams Plaza, Rt. 8, North Adams, MA 01247; (413) 743-7223



**Mike's Speedway**, Rt. 9, Mt. Farms Mall, Hadley, MA 01035



**R/C Hobbies & Speedway**, 1311 Purchase St., New Bedford, MA 02740; (508) 991-5040



**West St. Hobbies**, 114C Main St., Medway, MA 02053; (508) 533-1231



## MICHIGAN

**Baja Bayou Off-Road Raceway**, 5313 West 22 Mile Rd., Tustin, MI 49688; (616) 829-3447



**Can-Am Hobbies Speedway Park**, 1148 Gratiot, Marysville, MI 48040; (313) 364-3338



**Cereal City R/C Off-Roaders**, 2000 E. Columbia Ave., Battle Creek, MI 49015; (616) 963-2506



**Fun Tyme High Banked Oval**, Fun Tyme Adventure Park, 6295 E. Saginaw Hwy., Grand Ledge, MI 48837; (517) 655-5503



**Jonimo Hobby & Raceway**, 27788 Joy Rd., Livonia, MI; (313) 422-1830



**Ludington R/C Raceway**, 1483 N. Dennis Rd., Ludington, MI 49431; (616) 843-4654



**Mason County R/C Car Track**, West Shore Community College, Scottsville, MI; (616) 843-8553 or -4837



**More R/C Club**, 33538 23 Mile Rd., Chesterfield Township, MI 48047; Tom Kelly, (313) 773-5918, or Joe, 749-9774



**Off-Road Speedway**, 1940 Lakeville Rd., #28, Oxford, MI 48371; (313) 628-4320



**R&L Hobbies**, 10334 Portage Rd., Portage, MI 49002; (616) 323-3686



**R.G. Enterprises**, 600 N. Lafayette, Greenville, MI 48838; (616) 754-4919



**Rider's Superspeedway**, 42040 Koppernick, Suite 400, Canton, MI 48187; Brent Martin, (313) 451-5599



**Rider's Superspeedway**, 4415 S. Westnedge, Kalamazoo, MI 49008; Ken Penn (616) 349-2666



**USA Raceways**, 6083 Dixie Hwy., Bridgeport, MI 48722; (517) 777-7USA



## MINNESOTA

**Wild West R/C Speedway**, 2822 Piedmont Ave., Duluth, MN 55811; Roger Deloach, (218) 722-6248



**Minn-E-Golf & Hobby**, 9100 Park Ave., Elk River, MN 55330; (612) 441-8365



## MISSISSIPPI

**Norm's R/C Hobbies**, 310 E. Beach Blvd., Long Beach, MS 39560; (601) 863-0524



**Precision Hobbies**, 240 Eisenhower Dr., Biloxi, MS 39531; (601) 388-6346



**Small Cars Unlimited**, 820 Cooper Rd., Jackson, MS 39212; (601) 372-FAST



## MISSOURI

**Doug's Hobbies**, 5221 Veil of Tears, Jefferson City, MO 65109; (314) 893-5861



**Harrisonville Hobby Shop & Raceway**, 2301 S. Commercial, Harrisonville, MO 64701; Richard Taylor, (816) 887-3055



**Outback Speedway & Hobby**, 2810 Sutton Blvd., Maplewood, MO 63143; (314) 644-3383



**R + Hobby**, 590 Jungermann Rd., St. Peters, MO 63376; (314) 928-9838



**Bozeman R/C Powerhouse Track**, west side of the Main Mall, Bozeman, MT 59715; (406) 586-6461



**Garden City Raceway**, 6725 Hwy. 10 West, Missoula, MT 59802; (406) 721-5405



**Magic City R/C Raceway**, 14th St. W. & Central Ave., Billings, MT 59101; (406) 259-9004



## NEVADA

**Little City Hobbies Raceway**, 640 Kuenzki, Reno, NV 89503; Gregg Allen, (702) 786-3611



## NEW HAMPSHIRE

**4-K Racing**, 100 Warwick Rd., Winchester, NH 03470; (603) 239-6207



**C.T. Hobbies R/C Raceway**, 49 Eaton Rd., Auburn, NH 03032; (603) 483-2274



**Hobbies Plus R/C Raceway**, 14 Celina Ave., Nashua, NH 03063; (603) 882-9200



**Hobby Etc.**, Heritage Place, Rt. 101A, Amherst, NH 03031; (603) 595-8549



**R&B Racing**, Lily Pond Rd., Gilford, NH 03246; Louie, (603) 524-2909 or Bud (603) 524-1893



## NEW JERSEY

**Action Raceway & Hobby Center**, Rt. 295 & Harmony Rd., Gibbstown, NJ 08027; (609) 423-8933



**Glassboro's Grand Oval Speedway**, 167 S. Delsea Dr., Glassboro, NJ 08028; (609) 863-1551



**Hopewell R/C Speedway**, 138 West Broad St., Hopewell, NJ 08525; (609) 466-2715



**Jackson R/C Racing**, Marshall Ave., Jackson, NJ 08527; (908) 905-1593



**L.B.R.A. Track**, 392 Warburton Pl., Long Branch, NJ 07740; (908) 222-5122



**The Race Place**, Rt. 33 & 34, Farmingdale, NJ 07727; (908) 938-5215



**Radical Raceway & Hobbies**, 100 Rt. 17S, Lodi, NJ 07644; (201) 834-6996



**Tri-Oval Speedway & R/C Center**, 296 S. Main St., Phillipsburg, NJ 08865; (908) 454-2223



**Truck Challenge**, 1162 Rt. 202-206N., Bridgewater, NJ 08807; Michael Gill, (908) 658-9616



**Zepplin Hobbies**, 92 Rt. 23N, Riverdale, NJ 07457; Lou Ballini, (201) 831-7717



## NEW MEXICO

**Racers Inn**, 4300 Rankin Ln. NE, Albuquerque, NM 87107; (505) 345-5988



## NEW YORK

**A&D's FasTracks**, 1000 N. Main St., Brewster, NY 10509; (914) 279-2065



**A&S Race Center & Hobbies**, 120 Cayuga St., Canalview Mall, Fulton, NY 13069; (315) 598-2772



**Bellmore Raceway**, 2479 Charles Ct., Bellmore, NY 11710; (516) 783-3456 or 783-0105



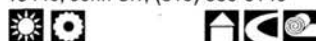
**Brockport Speedway**, 6000 Sweden Walker Rd., Brockport, NY 14420; Gil & Betty Glidden, (716) 637-6224



**Cars R/C & Guitars**, 4360 Seneca St., West Seneca, NY 14224; (716) 674-0905



**Central New York R/C Auto Racers**, Martin St., P.O. Box 116, Rome, NY 13440; John Orr, (315) 336-5140



**Chipmunk Hill R/C Speedway**, 217 Pine St., Theresa, NY 13691; Ted House, (315) 628-5065



**Dirt Track**, 17 Fairway Dr., Manorville, NY 11949; Billy Wroblewski (516) 878-0737



**East End Off-Roaders**, Route 25A at Gull's Square, Wading River, NY 11792; (516) 929-8844



## KEY TO SYMBOLS

- Indoor
- Outdoor
- Off-road
- Oval
- Dirt oval
- Carpet
- Concrete
- Asphalt
- On-site hobby shop
- AC power
- Automatic lap-counting
- Food available



# Track Directory

**Eliminator Raceway**, 125 Vermont Ave., North Babylon, NY 11703; Jim, (516) 321-6730



**Island Hobbies & Raceway**, 410 Commack Rd., Deer Park, NY 11729; (516) 254-6229



**Lakeside Raceway & Hobbies**, 712 Willow Ave., Ithaca, NY 14850; (607) 272-0248



**Latest Hobbies & Raceway**, Rt. 25A, Wading River, NY 11792; (516) 929-8844



**LI 1/4-Scale Racers**, 63 Horton Dr., Huntington Station, NY 11746; (516) 351-5384



**Maspeth Raceway**, Rust St. & 57th Rd., Maspeth, NY 11378; (718) 894-0800



**Queens Off-Roaders**, 42-12 13th St., Long Island City, NY 11101; (718) 392-5766



**R/C Competition Corner**, K-Mart Plaza, Mattydale, NY 13211; (315) 455-8718



**R/C Hobbies**, Rt. 49, Box 138, Constantia, NY 13044; (315) 623-9536



**R/C Speedway & Hobbies**, 1555 State St., Watertown, NY 13601; Steve Pena, (315) 788-1320



**Riverside R/C & Hobby**, P.O. Box 125, Rt. 126, Beaver Falls, NY 13305; (315) 346-1682



**Russet's R/C Racetrack**, 1793 Ridge Rd., Ontario, NY 14519; (315) 524-2522



**Schenectady R/C Speedway**, 955 State St., Schenectady, NY 12307; (518) 370-3747



**Schoharie Co. R/C Car Club**, P.O. Box 126, Cobleskill, NY 12043; (518) 234-4600



**Skaneateles Raceway & Hobby**, P.O. Box 102, Rt. 20, W. Genesee St., Skaneateles, NY 13152; (315) 685-8077



**South Shore Hobby & Raceway**, 311 W. Roe Blvd., Patchogue, NY 11772; Don Hauck, (516) 758-5567



**Walt's Hobby**, 2 Dwight Park Dr., Syracuse, NY 13209; (315) 453-2291



**Western New York R/C Speedway**, 58 Spring St., Cuba, NY 14727; Jason Congdon, (716) 968-3586



## NORTH CAROLINA

**C&H Raceway**, 1400 N. Cannon Blvd., Kannapolis, NC 28081; (714) 933-5321



**Cape Fear Speedway**, 107 Harley Rd., Wilmington, NC 28401; (919) 762-1184



**Carolina R/C Drag Assoc.**, 907-C Warsaw Rd., Clinton, NC 28328; (919) 592-9489



**Charlotte R/C Raceway & Hobbies**, 5820 Old Concord Rd., Charlotte, NC 28213; (704) 597-0608



**Granite City R/C Raceway**, 192-1 N. Main St., Mt. Airy, NC 27030; (919) 786-1466



**Hi-Performance Hobbies & R/C Raceway**, P.O. Box 320, Earl, NC 28038; Derrell Hollifield, Steve Bliss, (704) 482-4391



**Jacksonville International Speedway**, Hwy. 17N, Jacksonville, NC 28540; (919) 346-1522



**Joe's Hobby Shop & Raceway**, Rt. 2, Box 682-B, Bessemer City, NC 28016; (704) 435-2912



**Mountain R/C Raceway**, Hwy. 107N, P.O. Box 67, Glenville, NC 28736; (704) 743-3709



**Reedy Creek Raceway**, Rt. 14, Box 946, Conard Sowers Rd., Lexington, NC 27292; (704) 731-4022



**Sandhills Raceway, Inc.**, US #1 South, Aberdeen, NC 28315; (919) 944-7414



**Smiley Face Raceway**, 120 W. Center St., Mebane, NC 27302; (919) 563-3822



**TLC R/C Raceway**, Rt. 6, Box 321-A, Hwy. 601, Mocksville, NC 27028; (704) 492-7569



## NORTH DAKOTA

**Crystal Springs Off-Road**, 1200 53 Ave. SW, Minot, ND 58701; (701) 852-9590



## OHIO

**Alcraft's R/C Raceway**, 1370 Custer-Orangeville Rd., Brookfield, OH 44403; (216) 448-1573



**Classic Hobbies & Raceway**, 2845 W. Waterloo Rd., Akron, OH 44312; (216) 628-8427



**CRC Raceway/Toy Train Hobbies**, 1015 Lower Bellbrook, Xenia, OH 45385; (513) 372-6806



**Hi-Tech Hobbies II**, 116 Taylor St., Loveland, OH 45140; Rick Lewis, (513) 683-8900



**Hobby Mania Raceway**, 6597 Route 224, Lowellville, OH 44436; (216) 536-8282



**Innovative Hobbies/Lakeside Speedway**, 3427 Manchester Rd., Akron, OH 44319; (216) 645-1333



**KAR R/C Raceway**, 14511 Seacrest Rd., Salem, OH 44460; (216) 537-4039



**Mid-Ohio R/C Raceway**, 5367 Fishburg Rd., Huber Heights, OH 45424; (513) 233-2807



**Way Out Hobbies**, 5583 Centerpoint Rd., Georgetown, OH 45121; (513) 375-4984



**Y-City Hobby & Speedway**, 120 S. 6th St., Zanesville, OH 43701; Kevin McKenna, (614) 455-3025



## OKLAHOMA

**Off-Road R/C Autos of Tulsa**, 13349 E. 11th #B, Tulsa, OK; (918) 251-5592



**OKC Raceway**, 6707 NW 10th, Oklahoma City, OK; (405) 495-4820



**RCRC of Oklahoma**, 400 S. Vermont, Suite 104, Oklahoma City, OK 73108; Robert Jones, (405) 942-RCRC



## OREGON

**Buggy Boogie Race Track**, Rt. 4, Box 546, Astoria/Knapa, OR 97103



**Ed's Dirt Speedway**, 2809 N. Cherry St., La Grande, OR 97850; (503) 568-4332



**R/C Plus Hobbies Raceway**, 2029 25th St. SE, Salem, OR 97302; (503) 364-9188



**R/C Speed Center**, 2810 N. Pacific Hwy., Medford, OR 97501; (503) 779-8298



## PENNSYLVANIA

**Brian's Raceway**, 733 Flexer Ave., Allentown, PA 18103; (215) 435-1862



**Clearfield R/C Car Club**, P.O. Box 297, Clark Hill Rd., Hyde, PA 16843; Joe Welch (814) 765-3045



**Cressona Mall Speedway**, Rt. 61, Pottsville, PA 17901; (717) 385-3506



**East St. Raceway & Art Center**, 747 E. Railroad Ave., Verona, PA 15147; (412) 826-0602



**High-Tek Hobbies Raceway**, 13250 Rt. 30, North Huntingdon, PA 15642; (412) 864-5278



**Koontz's Home & Hobby Center**, 1205 Hoover St., Pittsburgh, PA 15204; (412) 331-3866



**L&R R/C Racing**, 15 S. Main St., Red Lion, PA 17356; (717) 244-1108



**Modellbahn Ott Hobbies**, 1145 E. Philadelphia Ave. (Rt. 73), Gilbertsville, PA 19525; (215) 367-5925



**Performance Hobby**, 1305 Main St., Slatington, PA 18080; (215) 760-9855



**Prop & Wheels Raceway**, 139 W. Broadway, Tamaqua, PA 18252; (717) 668-2288



**Radio Controlled Pro Speedway**, Rt. 487N, Stillwater, PA 17878; (717) 387-0266



**Riverside Raceway**, PA Ave. W & Hickory, Warren, PA 16365; Jeff Frailey, (815) 723-4211



**T&T Radio Controlled Racing**, Randolph Rd., Great Band, PA 18821; (607) 723-9357



**TC's R/C's**, 1537 Freeport Rd., Natrona Heights, PA 15065; Tom Coriale, (412) 226-1133



**Wagonhill Hobbyland**, RD3, Box 183, Slippery Rock, PA 16057; (412) 458-4711



## RHODE ISLAND

**East Bay Hobbies**, 629 Metacom Ave., Bristol, RI 02809; (401) 254-0778



**R/C Hobbies**, 47 Sandybottom Rd., Coventry, RI 02816; (401) 823-4335



## SOUTH CAROLINA

**Berea R/C Speedway**, 707 Sulphur Springs Rd., Greenville, SC 29611; (803) 246-4702



**Inland R/C Speedway**, 61 New Found Ln., Myrtle Beach, SC 29577; (803) 293-1753



**LB Co. Hurricane**, 112 Green Acres Rd., Blythwood, SC 29016; (803) 786-0984



**Palmetto Raceway**, 5023A Rivers Ave., N. Charleston, SC 29418; (803) 566-0068



**TBS Superspeedway**, Hwy. 151, Darlington, SC 29532; (803) 395-1551 or 332-7117



**TBS Superspeedway**, 800 Hwy. 15N, Hartsville, SC 29550; Johnny Tiller, (803) 332-7117



## SOUTH DAKOTA

**Dakota Off-Road Racers**, 2989 W. Br. Co. 12, Aberdeen, SD 57401; (605) 226-0604



## TENNESSEE

**D&M's Downtown Raceway**, 8 North White St., Athens, TN 37303; (615) 745-4288



**The Dirt Dome**, 575 W. Poplar Ave., Memphis/Collinsville, TN 38017; (901) 853-3428



**Tuckasee Off-Road Raceway**, 1104 Lafayette Rd., Clarksville, TN 37042; (615) 645-2635



## TEXAS

**AA Raceway**, 1617 Toomey Rd., Austin, TX 78704; (512) 474-8277



**Austin R/C Center**, 9702 Gray Blvd., Austin, TX 78758; Caton Cobb, (512) 832-8144



**Budget Raceway**, RR 1, Box 400 I-35, Bruceville, TX 76630; (814) 859-5296



**Checkered Raceway**, 8100 Kirkwood, Houston, TX 77072



**Finish Line Hobby Store & Raceway**, 11925 Jones Maltsberger, San Antonio, TX 78016; (512) 491-0088



**Hal's R/C Raceway**, 1440 Bessemer, El Paso, TX 79936; (915) 591-2213



**Hi-Tech Hobbies**, 1107 Port Neches Ave., Port Neches, TX 77651; (409) 724-2391



**Indy R/C World**, 220 Mesquite Village, Mesquite, TX 75150; (214) 686-7744



**Norm's R/C Hobbies & Raceway**, 2551 Lombardy, Suite 160, Dallas, TX 75220; Norm Mazzola, (214) 357-3453



**R/C Pro Shop**, 3303 N. Midkiff, Midland, TX 79705



**Spring Creek R/C**, 45 Fisherman's Rd., San Angelo, TX 76904; (915) 944-3850



**TK's R/C Park**, 2921 Old Claude Hwy., Amarillo, TX 79101; (806) 622-0017



**Z Track**, 1550 Dunnam Dr., Abilene, TX 79602; Chi Chi, (915) 692-8477





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**Intermountain R/C Raceway**, 8481 W. 2700 S., Magna, UT 84044; (801) 250-8303



**W.O.R. Raceway**, 3150 Brinker Ave., Ogden, UT 84401



## VERMONT

**Mike's Hobbies & Raceway**, 162 N. Main St., Rutland, VT 05701; (802) 775-0059



**Silver Towers Raceway**, Elks Club, North Ave., Burlington, VT 05401; (802) 658-4490



## VIRGINIA

**A-1 Raceways**, 940 Radford Rd., Christiansburg, VA 24703; Kay or Charles Franks, (703) 382-1173



**Bob's Hobbies & Raceway**, 910-J Brandy Creek Dr., Mechanicsville, VA 23111; Bob Wagner, (804) 746-2758



**Cooper's R/C Raceway**, Rt. 4, Box 12203, Chatham, VA 24531; (804) 724-4182



**Mid Atlantic Raceway**, 89 E. Elizabeth St., Harrisburg, VA 22801; (703) 433-3952



**The Race Place**, 3180 King William Ave., Westpoint, VA 23181; (804) 843-4933



**Winners Circle**, 3236 W. Clay St., Richmond, VA 23230; (804) 355-7076



## WASHINGTON

**Alfie's**, 108 South K St., Aberdeen, WA 98520; (206) 533-6638



**Arlington Heights Speedway**, 13629 228th St. NE, Arlington, WA 98223; Shawn Bussert, (206) 435-3442



**Four Seasons R/C Racing**, 146 School St. SE, Olympia, WA 98506; (206) 491-2430



**Hank Perry Race Complex**, Sullivan Rd., WA 99213; (509) 927-1879



**Tacoma R/C Raceway Hobbies**, 6305 6th Ave., Tacoma, WA 98406; (206) 565-1935



## WEST VIRGINIA

**R/C Race Place**, Rt. 10, Box 351, Morgantown, WV 26505; (304) 292-0811



## WISCONSIN

**Fox Valley Off-Road Racing Club**, R1, Mayflower Rd., Hortonville, WI 54944; (414) 739-9211



**Frog's R/C Raceway**, Rt. 1, Phillips, WI 54555; (715) 339-2314 or 339-2958



**Hobbytown Speedway**, 4231 8th St. S., Wisconsin Rapids, WI 54494; (715) 421-1222



**Hobby World Speedway**, 3198 London Rd., Eau Claire, WI 54701; (715) 834-0456



**JJ's Dirt Heaven**, 6028 County K, Champion, WI 54229; (414) 866-9096



**Maniac Motors Raceway**, 244 Rt. 1 A1 Rt. H, Kendall, WI 54638; (608) 847-4833



**Midwest Tri-Clone**, 144 N. Main St., West Bend, WI 53095; (414) 334-0487



**The Pits Hobby Shop**, 786 Morris Ave., Green Bay, WI 54304; (414) 494-4200



**R/C Spectacular**, Milwaukee Mecca Auditorium, c/o Wisconsin Motorsports Show, 11020 W. Rogers, Milwaukee, WI 53227; (414) 327-3999



**Stoltz Raceways**, 548 Summit Dr., West Bend, WI 53095; (414) 338-6097



**West Bend Hobbies**, 144 N. Main St., West Bend, WI 53040; (414) 334-0487



## CANADA

**Aprilia Track**, 20 Parsons Ridge, Kanata, Ontario, Canada K2L 2N4; (613) 836-2577



**Autodrome des Prairie**, 935 Boul. St-Luc, St-Luc, Quebec Canada J0J 2A0; (514) 348-0718



**Autodrome Sher-Hobby**, 1035 Panneton, Sherbrooke, Quebec Canada; (819) 820-1151



**Cantraxx Raceway**, 8876-48 Avenue SE, Edmonton, Alberta Canada T6E 5L1; (403) 469-9193



**Circuit R/C Bonzai**, 164 Cowie, Granby, Quebec, Canada J2G 3V3; (514) 372-3622



**Circuit St-Denis Auto Teleguide**, 292 DuLion, St-Denis, Quebec, Canada JOH 1K0; Francois Rivard, (514) 787-1127



**Crash Course**, Box 9, Site 8, RR #1, Spruce Grove, Alberta Canada T7X 2T4; Tim Starrevelde (403) 963-5795



**CRCD**, 4565 Bh St-Joseph, Drummondville, Quebec Canada J2A 1B4; Jacques Lefebvre, (819) 474-4001



**GRSCR**, 9 Gauthier, St-de L'Acigan, Quebec Canada J0K 3H0; (514) 588-4254



**Hobby Center**, SQS.210 Bl.H, Apt. 204, Brasilia, DF-Brasil 70.273; 061-242-0488



**Honda House Motor Speedway**, 384 Richmond St., Chatham, Ontario Canada N7M 1P9; (519) 354-5530



**J-T International Raceway**, 127 Milligan Lane, Napanee, Ontario Canada K7R 8A1; (613) 354-0099



**Quintrax Speedway**, Box 1034, Belleville, Ontario Canada K8N 5B6; (613) 962-1414; Fax; (613) 962-7306



**Rousillon Hobby Track**, 177-D St-Jean Baptiste, Chateauquay, Quebec Canada J6K 3B4; (514) 698-2151



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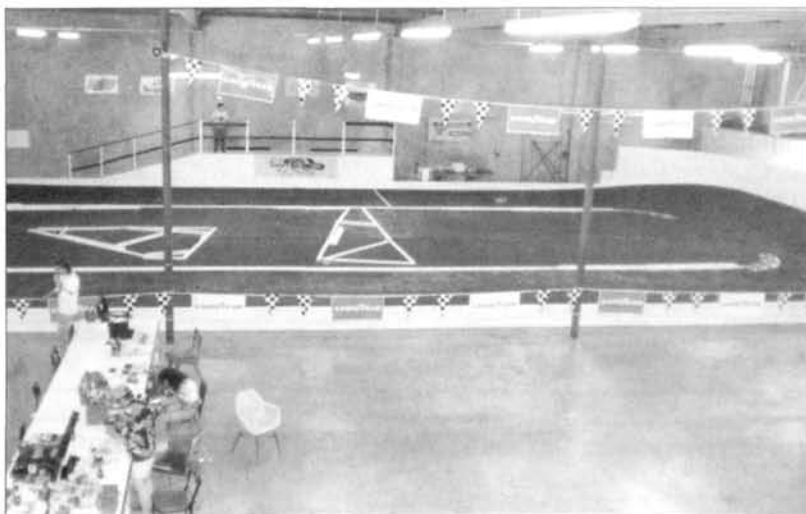
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The action starts on Thursday nights with 1/12- and 1/10-scale on-road racing. Racers shoot down straightaways, then in and out of tight turns to test their driving skills. On Friday nights, 1/10-scale oval racing thrills spectators; 12-foot-wide straightaways and banks make passing easy. On Saturdays, the track is restored to the roadcourse for more on-road racing action. Spectators watch as drivers trade paint for position and maneuver their cars around 10-foot-wide turns. On Sundays, there's more oval action as gearbox classes pound the pavement. The sprint car and buggy classes are especially exciting. Tuesdays and Wednesdays are reserved for open practice from 11 a.m. to 8 p.m. Fast Eddie closes his track on Mondays so that he can restock his parts store and organize his service center.

For more information, call (408) 986-8256, or check out Fast Eddie's R/C Raceway at 3261 Edward Ave., Santa Clara, CA 95054.





Megabuck

MISSILE

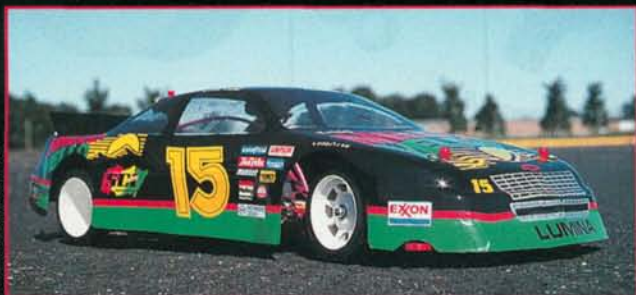
by  
JIM  
SHEPKA

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Oval Nationals (held  
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Kent Clausen debuted the  
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successful results. Now, there  
isn't a major company that hasn't  
jumped on the bandwagon to intro-  
duce its own narrow car. A lot of folks in

the  
indus-  
try said,

"It's just  
a fad." Ever  
wonder what  
crow tastes like?



PHOTOS BY JIM SHEPKA



# Project RC10L

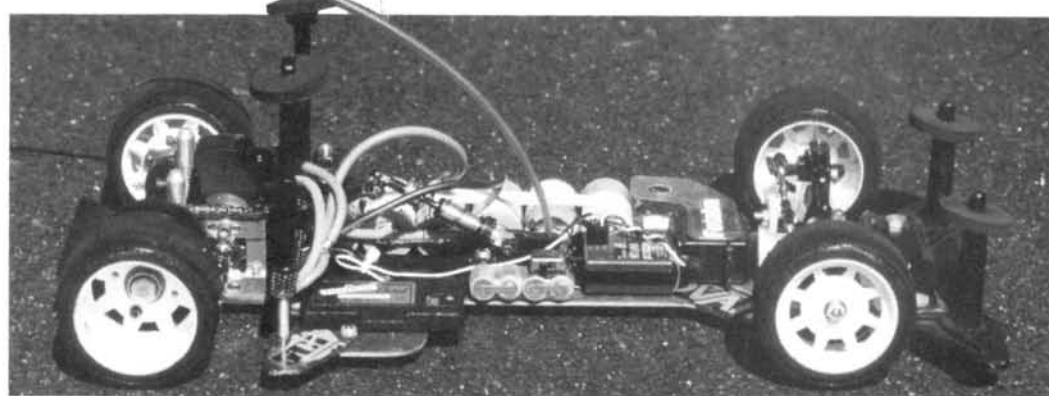
## S U P E R S P E E D W A Y

Why mess with success, you ask? You can always go a little faster (driving skill notwithstanding) and besides, I had a few extra bucks burning a hole in my pocket. After-market projects are always fun, so I jumped at the chance to turn my stock 10L SS into something personal and unique.

### ON THE OPERATING TABLE

I began the transformation by dismantling the entire car. I inspected all components for wear, and I put the stock components off to the side. Next, I checked all the trick after-market parts that I had ordered, and made sure that I had all the necessary hardware. Then, I turned my attention to the new chassis plate.

DA Graphite's\* custom



*This DA Graphite custom chassis is the starting point for Project 10L SS. Its front three inches are made of solid graphite, while the rest is graphite with a wooden core.*

Left Turn Only chassis plate was designed to be extremely stiff and light, thanks to the combination of its materials. The front three inches of the chassis are 100-percent quasi-isotropic, uni-directional solid graphite (.10 inch thick), and the remaining plate has a wooden core. This chassis also has a high level

of lateral strength, which reduces side-to-side flexing. To accommodate the batteries, semi-circular slots have been routed into the chassis. This design retains nearly 40 percent of the bottom plies; this allows the cells to fit precisely on the chassis. This concept concerned me, because graphite is conductive, but as long as the shrink wrap around your cells is in place, I don't think it's likely that they'll short out.

I attached the T-plate assembly to the new plate very quickly. I incorporated Cheetah Racing's\* threaded damper tube and did away with the original solid damper post and nylon set-screw adjusters.

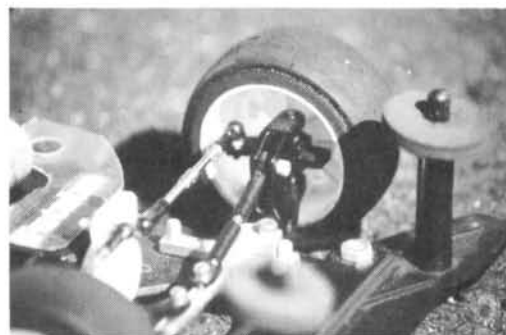
The new center post allows for much easier adjustments with nylon nuts. While I was at it, I added a pair of Ultra<sup>5</sup>\* Teflon damper disks to the friction plates.

Now that the side roll of the rear end was working smoothly, I turned my attention to the fore/aft part of the suspension. Although it wasn't a bad unit, I tossed the stock shock in favor of Hyperdrive's\* new shock absorber. It's quite similar to

a Delta unit, and it appears to be effective and durable. The instructions were straightforward, and I had it together in no time.

I then replaced the stock aluminum lower-axle carrier brace with HPI's\* new Aero Brace with a 30-degree kick-up. Although graphite doesn't dissipate heat as well as aluminum, the Aero Brace protects your spur gear from impact and adds extra downforce to the car on the big ovals.

In keeping with my high-tech approach to this project, I replaced the rear-axle bearings with a new set of Ultra-Seals from Boca Bearings\*. After these low-friction,



*The stock 10L front suspension was replaced with a BME magnesium split front-axle assembly that has adjustable caster and camber.*

"maintenance-free," precision bearings were in place, I added a set of Ultra Hubs from MK Engineering\* to the drive line (see Steve Pond's

P A R T S L I S T

<b>DA Graphite:</b>	custom graphite chassis plate
<b>Cheetah Racing:</b>	threading damper tube, Ultimate front end
<b>Ultra<sup>5</sup>:</b>	Teflon damper disks
<b>Hyperdrive:</b>	shock absorber
<b>HPI:</b>	Aero Brace with 30 degree kick-up
<b>Boca Bearing:</b>	Ultra-Seal bearings
<b>MK Engineering:</b>	Ultra Hubs
<b>Du-Mor:</b>	108-tooth, 64-pitch spur gear
<b>Bud's:</b>	pinned diff rings
<b>Futaba:</b>	132H servo, PCM 1024 FM transmitter
<b>Kimbrough:</b>	large servo saver
<b>Tecnacraft:</b>	titanium steering rods
<b>Novak:</b>	NER-3FM receiver
<b>Max-Cell:</b>	6-cell Sanyo 1700 SCE
<b>Trinity:</b>	Speedworks 13-turn, double-wind Tri-Rotor "Oval Man" motor
<b>SCI Corp.:</b>	Power Card 1000/260-A ESC
<b>Dahm's Racing:</b>	Lumina "Thunderbody"
<b>Pactra:</b>	R/C spray paint
<b>Parma:</b>	Mellow Yellow decals
<b>Bolink:</b>	Black Dot rear tires, Blue Dot fronts (NASCAR Rims)
<b>Holeshot:</b>	Super Cooler 2001



# Project RC 10L

## S U P E R S P E E D W A Y

description of them in the March '91 issue of *Car Action*). I like the way that the left hub pinches the axle without using setscrews, which would dig into the graphite. I retained the stock graphite axle and trimmed off the excess overhang from the left side. I also used a Du-Mor R/C\* 64-pitch spur gear, Bud's\* pinned diff rings and a set of ceramic diff balls. When it was assembled, the drive line operated smoothly.

I used Cheetah Racing's "Ultimate Front End" kit, which uses a traditional hub/axle-block carrier assembly. Its axle is also split; this allows for independent camber adjustment. Caster is adjusted by shortening or lengthening the adjusting rods. A pin is inserted through the axle and the lower portion of the kingpin, allowing the entire block assembly to pivot. All in all, it's a very effective unit.

which I connected to a pair of Tecnacraft\* titanium steering rods. Because I was using my trusty PCM 1024 FM transmitter, I chose Novak's\* new NER-3FM receiver (75 MHz).

The horsepower end of this project rested on the shoulders of a Max-Cell\* matched Sanyo 6-cell SCE pack and a Speedworks\* Oval Man motor. For motor management, I chose one of SCI's\* new generation of electronic speed controllers.

The Power Card 1000/260-A uses surface-mount components on a high-quality fiberglass/epoxy circuit board. The board is covered with a green film in a special vacuum process for increased

I had problems coordinating the neutral position with the trigger control on my transmitter. I contacted SCI's U.S. agent, Gary Jones, but he wasn't able to pinpoint the problem for me. The next

work in 1/10 scale? I won't know how this design compares with a wing design until I hit the track. I painted the body with Pactra's\* black gloss; Parma's\* Mellow Yellow decals added the

NASCAR realism that I was after, and the absence of a wing really makes it look scale.

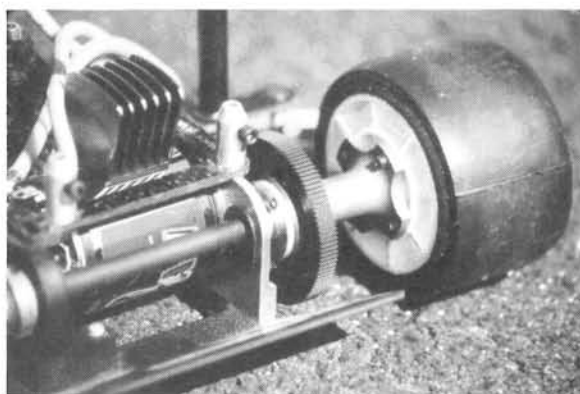
### IT LIVES!

I planned to test the car at Megatrak in New Jersey, but when the weather failed to cooperate, I switched to foam tires and headed to my old standby—Mike's Speedway

in Hadley, MA. This is Friday night short-track racing at its best, and you had better be dialed in, or you'll be eating dust. I had run my stock SS here before, so I knew what to expect. With Bolink\* black dots on the rear and blues on the front, the car's handling was satisfactory. Unfortunately, the track didn't bring out the true potential of my modifications. It's a flat track with very small straights—not really a fair test bed! I did like the adjustable camber/caster front ends that I used, though. Coning of the front tires was eliminated, and the car accelerated well off the turns.

My next test was at a NERCAR-sponsored oval event in Enfield, CT. More than 100 participants showed up for the annual "Sparks and Smoke," a gas and electric event. This time, I equipped the car with a full complement of Bolink black dots and I managed to qualify 4th in the A-Main. Reaching top speed at the end of the

(Continued on page 170)



*The lower axle brace was replaced with HPI's new Aero Brace. Its features include 30 degrees of rear kick-up to improve aerodynamics, and a protrusion to protect the spur gear in a rear-end collision.*

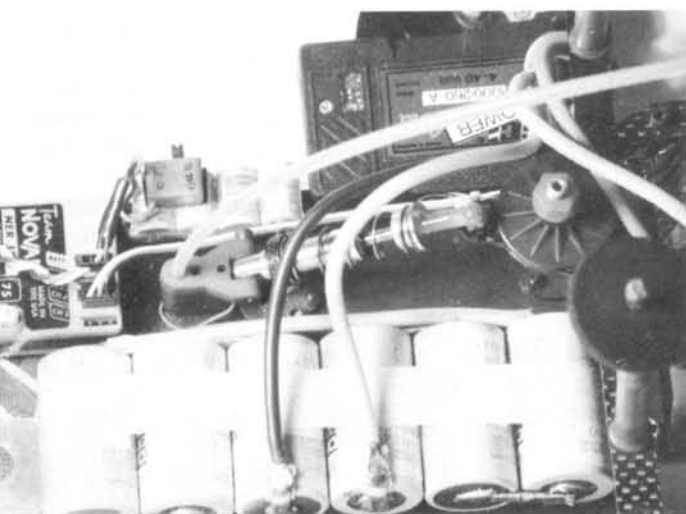
day, of SCI's engineers called—from SCI headquarters in Vienna, Austria!—and we resolved the problem. You have to appreciate this type of customer support!

I needed a body that fit this narrow chassis, so I chose one of the latest releases from Dahm's Racing\*, the Lumina "Thunderbody" (a two-piece aerodynamic package that's supposed to eliminate the need for a wing). A Lexan underbody tray is attached to the chassis plate with servo-mounting tape. The body is then mounted to the undertray; in theory, this should seal out air flow from around the nose of the car and re-direct it to the rear pod area for added downforce. A one-piece spoiler is then added to the rear deck of the car (with nylon fasteners). I already had the HPI kick-up plate, so I didn't think it was necessary to include the back portion of the Lexan ground-effects plate.

Indy and Formula 1 cars have been using ground effects for years, but will it

protection from the elements. Screw potentiometers and LED indicators (forward/brake) make adjustments very simple. The switching frequency is dependent on transmitter pulses; it minimizes transmitter interference.

When I adjusted the ESC,



*A Hyperdrive shock is fitted to the 10L SS. Power is provided by a Max-Cell matched SCE pack and is routed through an SCI Power Card ESC.*

After the chassis was brought up to speed, I needed to get the electronics package aboard. I opted for a Futaba\* 132H steering servo, which I mounted directly to the chassis plate with servo-mounting tape. I also used a large Kimbrough\* servo-saver,

## TRX-1

(Continued from page 36)

together well and required no additional fitting to make them work properly. Again, those E-clips—what can I say?

● **Front shocks.** The front shocks go together in the same way as the rear ones. (Be careful not to tear the O-rings when you insert the shafts.) I chose the two-hole pistons and filled the shocks with 30W oil. Remember that this is only a starting point; set-up will vary with track conditions. For the front shocks, Traxxas supplies its ultra-soft silver springs, which should provide more-than-adequate steering response. To begin with, mount the front shocks on the outermost hole on the shock tower, and on the middle hole on the front A-arm. In this position the shock action will be as linear as possible, so damping will be consistent throughout the entire range of suspension travel.

● **Battery holders.** These unique holders have an antenna mount, and they can be mounted upside-down to provide mounting space for radio gear, e.g., an electronic speed controller.

(Continued on page 118)



Ultra Light Aluminum Wheel Hubs



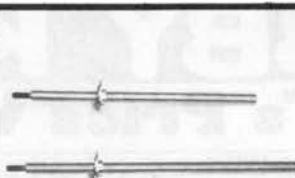
Aluminum (Double Strength) Wheel Bolts



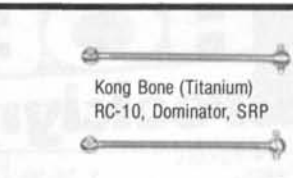
Original Bearing Buddy



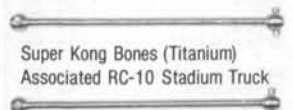
Motor Buddy Commutator Cleaning Kit



1/10 Scale, 1/12 Scale Pro Titanium Axle



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When the shocks are in the fully compressed position the dog bones can jam the outdrive and tranny without a restrictor.

### T&AMACHINE

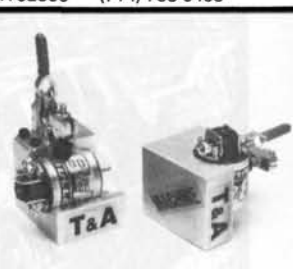
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## TRX-1

(Continued from page 117)

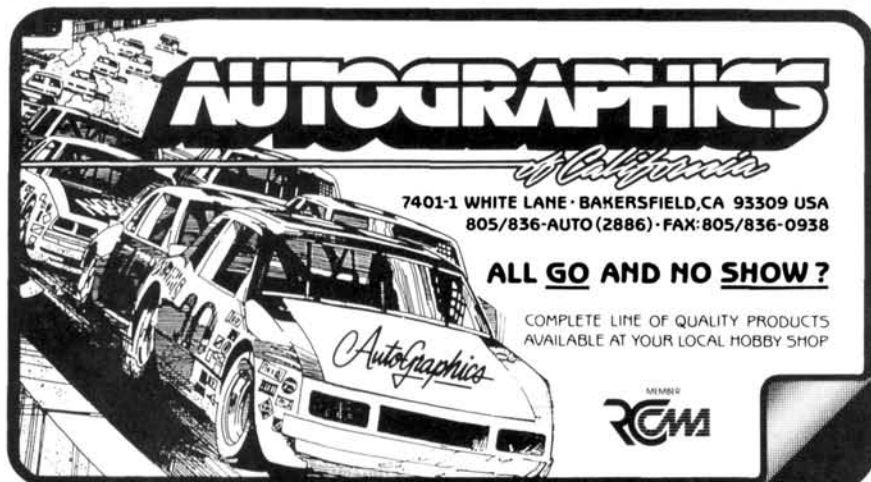
### WHEELS AND TIRES

The TRX-1 comes with one-piece, molded, 2.1-inch front rims and 2-inch rears, which are both ROAR-legal. The Pro-Trax six-row ribbed tires (part no. 4740) for the front are included, and they should work well on most surfaces; M-compound Pro-Trax pin-spikes (part no. 4750) are used in the rear. In stock form, these tires will perform well on medium-hard packed dirt, and if you trim the spikes, they should "hook-up" on harder surfaces. An interesting note about the TRX-1 kit's rear tires: they're the ones that Associated/Peak Performance driver Carlos Gonzales used during his TQ run at this year's ROAR Off-Road Nats (although he didn't run a Traxxas car).

### RUNNING GEAR

With the chassis complete, it was time to choose the radio gear and the other support pieces that would enable the TRX-1 to live up to its performance potential. For starters, I attached a Futaba® S132H servo to the steering bellcranks and plugged it into a Novak® NER-3FM receiver.

(Continued on page 129)



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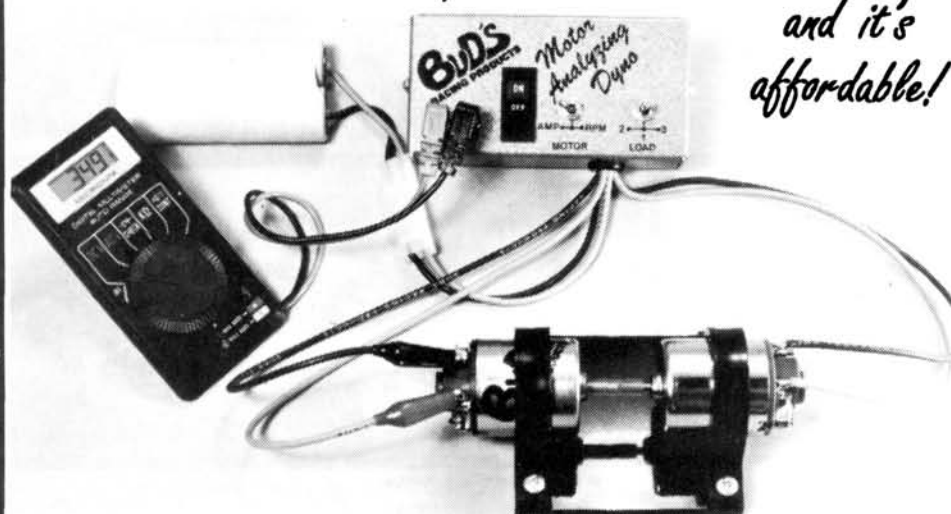
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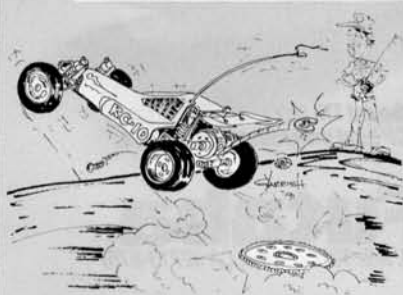
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# TROUBLESHOOTING

by STEVE POND

Illustrations by GERRY YARRISH



## TOTAL E-CLIPS

I use slicks on my Associated TQ10, but every time I hit a little bump, the E-clip on the outside of the transmission pops out, and the whole spur gear and the upper differential shifts out of line. I need help!

I have a Kyosho stock 34-degree motor, a Futaba Magnum Sport radio, an MC112B speed controller and a 7-cell Sanyo 1200mAh battery. I need a cheap way out of this! Some people have suggested that I use a Stealth, or another new transmission, but I can't afford it! Please, *Car Action*, help me!

**Cody Westheimer**  
Goleta, CA

*Your problem isn't common. I've had a lot of experience with stock RC10/TQ10 transmissions, and I've never had the problem you've described. These transmissions work very well; if they're properly assembled, they shouldn't cause any problems.*

*It sounds as if you aren't installing the E-clip properly. Make sure that you carve away a section of the plastic bearing holder and that you snap the E-clip firmly into place. The easiest way to seat it is to line it up with the groove on the shaft and, with a small screwdriver, snap it into place by prying against the edge of the bearing holder.*

## MOTOWN SLOWDOWN

I own a Royal Crusher MT that's equipped with a Team Losi Motown Missile motor, full ball bearings, a Futaba MC112B speed controller, Sanyo batteries, HPI rims and Pro-Line tires. My problem is this: the forward on my Traxxas XL-1 ESC burned out, so I bought the MC112B ESC and had to change the receiver plug to install it. My truck goes almost twice as fast, but it only gets about half the run time (6 minutes, 8 seconds out of an SCR 6-cell pack). With the XL-1, the truck ran for about 10 minutes (using the same pack). Is 6 minutes normal, or is my truck messed up?

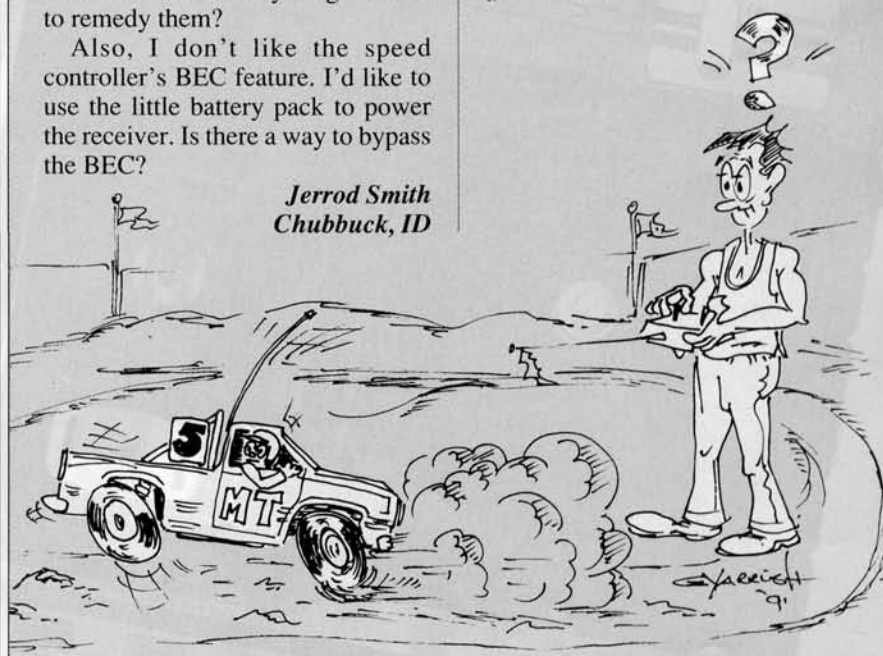
Sometimes, when I make a turn (in either direction), the inside tires lift off the ground; this results in very wide turns. If I let off the throttle at any time, the rear tires lock up and the truck stops almost instantly; if I turn, it spins out. These things never happened before I put in the new speed controller. Is there anything I can do to remedy them?

Also, I don't like the speed controller's BEC feature. I'd like to use the little battery pack to power the receiver. Is there a way to bypass the BEC?

**Jerrold Smith**  
Chubbuck, ID

*Six minutes is an excellent run time, considering you're using a 12-turn, single-wind modified motor. The change in speed controllers shouldn't affect your run time that much, so I think your estimate of run time with the first speed controller might be a little generous.*

*My advice on the BEC is: if it ain't broke, don't fix it! If you're having radio trouble that you can attribute to the BEC, by all means bypass it and use a receiver pack. The amount of current the BEC draws, however, is minimal, and it isn't likely to affect the run time noticeably. If you still choose to eliminate the BEC, remove the red wire from the harness that runs from the speed controller to the receiver. After you've done this, you can plug a battery pack directly into the receiver. Be sure to remove the red wire from the plug on the speed controller before you plug in the battery; failure to do so will damage the receiver.*





If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at Radio Control Car Action, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897.

## PUT HIM IN TRACTION

I've equipped my Blackfoot with a Speedworks Monster Mash motor and a Novak 610-RV ESC. My problem is traction. When I give the truck throttle, its tires spin like crazy, but it doesn't go anywhere. I'm using stock tires until I have enough money to buy new ones. My friends say that I should use spiked tires in the rear and ribbed tires in the front. Is this true? I run the truck on grass most of the time, just for fun, but I'll be racing locally soon. Which patterns should I get?

I'm also looking for a complete differential kit. I've heard that Thorp makes a good one, but I'd like your recommendation.

Mike Longo, Lyndhurst, NJ

*The Blackfoot's stock tires don't provide very good racing traction, so I certainly recommend that you purchase a new set. Your friends' advice about tread patterns is very good. Pro-Line's no. 7090 or Team Losi's HT Mini Pins (no. 7620) are excellent rear tires for use on medium-to-hard surfaces, and they wear very well. I suggest that you use Losi's H.T. Ribbed Monster-Truck front tires. They've provided me with better handling on a variety of surfaces than any other ribbed, front truck tire.*

*The Thorp differential kit is excellent for the Blackfoot. The no. 2000 kit includes the diff, a counter gear, dogbones, drive shafts and aluminum wheel hubs, and it's available with stock, hex-shaped dogbones, or performance-oriented standard dogbones. It includes everything you'll need to perform the conversion. The components are also available separately.*



## SERVO STRAIN

My USA-1 ran fine until I replaced its speed controller with a Magnum PCM 1024. Since then, it has been nothing but trouble. I've had to replace many servos and other things. Is the problem in the controller or the truck?

Mystery Racer  
Worland, WY



*I've used the PCM 1024 since its introduction, and I've never had any trouble with it. The problem is a result of your truck/servo combination.*

*PCMs come with your choice of 9601, S132, or 9301 servos. Because of their weight and the size of their tires, monster trucks require very powerful servos. Neither the 9601 nor the S132 is powerful enough to turn your truck's mammoth tires. At the very least, you should be using a 9301—maybe something stronger. For more information, check out the "Racing Servo Roundup" in this issue. Here's a tip: look for something with more than 50 ounce-inches of torque.*

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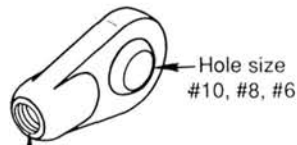
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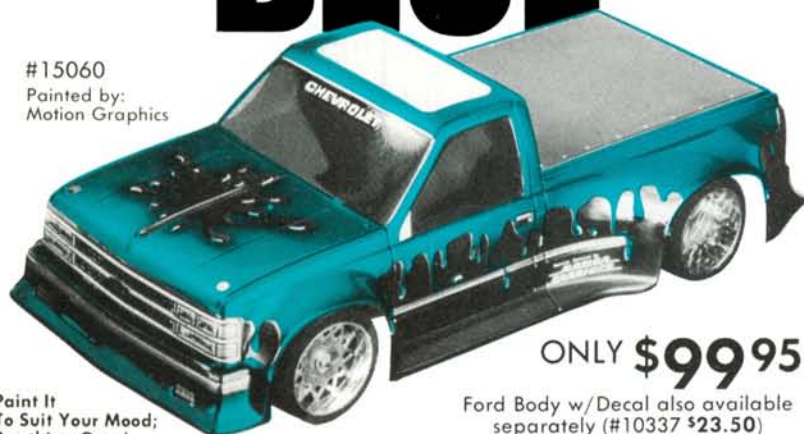
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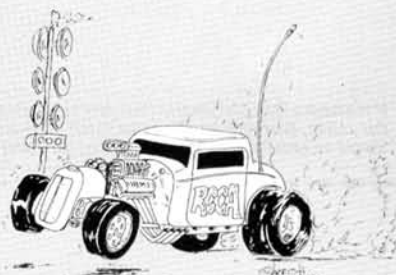
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## TROUBLESHOOTING



### SHAKE 'N' BAKE

I loaded my Parma Hemi Coupe with two 6-cell matched Trinity SCR 1400mAh packs, a Trinity Nuclear Assault motor and a Novak 828-HV speed controller. (Everything else was stock.) It ran a 2-second scale quarter-mile when I tested it. After a few passes, the batteries were low, so I discharged them, then I recharged them. When I hooked up the batteries, the motor began to run. I tried to turn it off, but to no avail. I checked my radio, and it wasn't on! I disconnected the batteries, but I had already burned up the speed controller—in seconds! I was only using 12 batteries, and that speed controller is supposed to handle up to 28! I need help!

**Ken Holyfield**  
Fairbanks, AL

*Without examining your speed controller, it's difficult for me to diagnose its ailment. I called Novak Electronics, and they told me that it's possible that you hooked up the batteries in parallel instead of in series. Wiring the batteries in parallel (two battery packs that share the same speed controller input connection) is essentially the same as using just 6 cells. The 828-HV is designed for use with at least 8 cells (the "828" in the model number designates the number of cells the unit was made to operate with; in this case—8 to 28 cells), so a 6-cell battery wouldn't be providing adequate voltage to power the unit's BEC. Wiring a battery pack in series means that all of the cells in the pack are connected by polarity (i.e., positive connects to negative, etc.).*

*Novak recommends that you send the ESC back to them for analysis and repair. If the unit is still under warranty, send a receipt and a brief summary of the problem as well.*





Top: The Pro Stock Buggy A-Main winners. From left: Craig Lair, Ken Bassett (CD), Justin Byerly, Dominic Seller, Roy Powell.



Right: This colorful collage includes the most impressive Concours entries.

# Welcome Home Race

by MIKE LEE

**F**OR MANY Americans, 1991 began in turmoil. For the first time in more than a decade, the U.S. faced the awesome prospect of all-out war. Although the soldiers of the first all-volunteer military force since the Revolutionary War were well trained, most had never been tested in combat. They did, however, rise to the occasion. In approximately 103 hours

**Honoring  
those who  
served**

of combat, American and allied troops defeated the fourth-largest army in the world. This victory sparked pride and patriotism across the land and, as our soldiers returned home, there were many parades. Naval Commander Kenny Bassett decided to make good, clean, all-American R/C fun part of this celebration.



Below: Dan Moynihan got his hands on the "rocket-powered" speed car. Its performance was stable during its 45mph runs.

He organized the first annual Welcome Home Off-Road Race (held on June 29 and 30, 1991) for the troops at the Naval Training Center in San Diego, CA.

Bassett has been involved with the hobby for the past five years, and he has also served as a race director. As an enlisted Navy man, he rose through the ranks by joining the special forces teams (he also served on a submarine) that most career Navy men envy. Bassett became a commissioned officer and rose to his current rank, but he's still a down-to-earth guy who loves the R/C hobby.

Now, couple Bassett with another live wire named Dan Moynihan (of Dan's RC Stuff), and you have one dynamic team! Moynihan used all his industry contacts to find sponsors who would ensure that the troops got a big taste of R/C hospitality. He also enlisted the help of NORRCA and J.R. Sitman. The result?—a big-time, off-road race with an R/C industry road show all for the Naval troops. It was great!

## CONCOURS AND CLASS ACTS

There were more than a dozen manufacturers' booths and over 180 drivers, many of them military personnel. Although the civilian spectators and drivers easily outnumbered the G.I.s, it was still a race for the troops.

The ever-popular Concours Event was first, and about 65 cars and trucks lined up to be judged. Three stock-car



**Capt. Paul Johnson, Commander of the Naval Training Center, stands with the Concours winners. From the left are Don Baligad, Bryon Kromary, Capt. Johnson, Neil Meek and Eduardo Cuenca.**

☆ ☆ ☆ ☆

drivers (members of racing teams that had full-size autos on display at the race) were selected as judges. The winners were Donald Baligad of Vista, CA, Bryon Kromary of San Diego, CA, Neil Meek of El Cajon, CA, and Eduardo Cuenca of Tijuana, Mexico. Baligad and Kromary took the top positions in the buggy and truck classes, respectively.

The opening ceremonies were held right after the Concours Event, and the

ceremony director was none other than the commanding officer of the Training Center—Captain Paul Johnson. (I served in Uncle Sam's Air Force for eight years, and believe me, getting a base commander to participate in an event like this was a major miracle!) A color guard presented the U.S. colors and organizational flags while the national anthem played over the PA. The Navy knows how to start a race.

The Naval personnel were very helpful. They groomed the track and provided electricity, pit space—even shade for the drivers! Even those in the

*Car Action* booth received extra help. The *Car Action* banner had gotten very dirty, so an officer grabbed the banner and proceeded to wash it. His only remark was, "Let me show you the real Navy." When he was finished, it looked brand-new.

## TRACK TALK AND SPECIAL RACES

The track seemed easy—until you tried to drive it. The jumps were placed carefully, and though none of them were very big, they were large enough to make the races very challenging. The track's surface was good—it was a drivers'



**Carl Lebahn and Jay Anderson chat just before the start of the Navy Challenge Race. (Lebahn won and Anderson finished in 2nd place.)**

## KEEPING UP MORALE

The San Diego Naval Training Center is the Navy's equivalent of boot camp, and approximately 28,000 people are trained there each year. After 12 grueling weeks of basic training, they're sent on to advanced training centers.

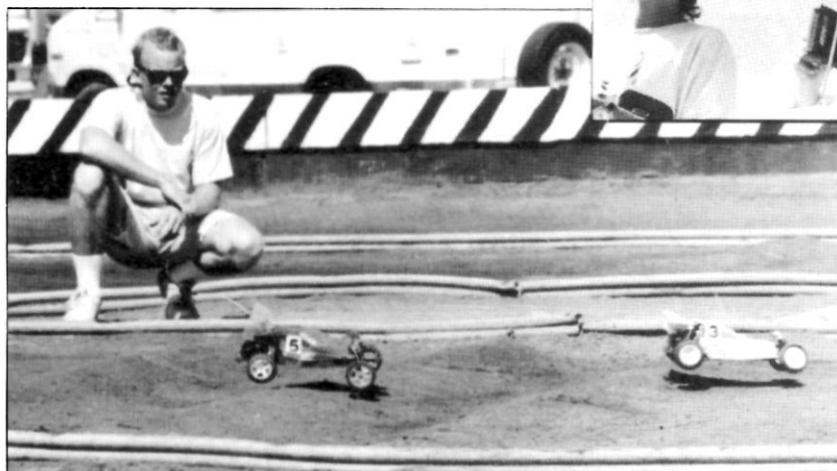
During the Welcome Home Race, it was quite a sight to watch the new troops drill. If I were given the military treatment all day, I'd definitely look for a relaxing R/C race as soon as possible. This is where Morale, Welfare and Recreation (MWR) comes in. It sponsors many of the much-needed recreational activities, e.g., bowling, golf, camping trips and crafts, on a military base. (Working for the MWR is a real treat. I spent my first year in the Air Force as the MWR supply officer, and I considered the position to be an on-the-job vacation.)

When the MWR people at the Naval Training Center decided to sponsor R/C activities, they built a top-rate track with a well-stocked hobby shop. If you're a member of the military, look up your MWR organization, and see what it can do for you.



# WELCOME HOME

■ **Right:** Three-year-old Andrew Saldate had never driven an R/C car before the Welcome Home Race, but he still beat many of the big guys. Is he a future champion? You never know!



■ **Left:** Eric Soderquist (alias Dr. Von Quick) keeps a close eye on a couple of buggies while he marshalls the track's "rhythm section."



track—but it had to be watered after almost every race.

The Navy Challenge Race was held on Saturday. Drivers were "drafted" from active-duty personnel, and they raced Traxxas Hawk trucks. Basic-grade enlistees and field-grade officers alike participated, and the enlisted guys didn't hold back for the officers. Carl Lebahn, a seaman from Chicago, IL, pounded the rest of the field on the way to his first-ever win with an R/C truck. Jay Anderson of Indianapolis, IN, finished 2nd, followed by Tracy Duty of Arkansas. Funny, none of the officers even placed!

Sunday's Powder Puff Race put the women in the spotlight. They also used the Traxxas trucks, but this time it was pandemonium on the track! Although the women had coaches to help them, they were all first-time drivers. Trucks traveled everywhere, and the track marshalls were becoming an endangered species. Donna Smith eventually took the lead and hung

on for the win. Tammy Burt came in 2nd and Linda Jones, manager of the Morale, Welfare and Recreation (MWR) operation at the Training Center, took 3rd.

## THE MAIN EVENTS

The racing was competitive and exciting in all the classes. Jason Sugg took the top honors in the 2WD Stock Class, and he was followed by Jerry

Fernandez and Dan Gallego. In the Open 2WD Class, Chris Allec, Kyle Reed and Scott Anfinson battled it out from wire to wire. Allec eventually won, but Reed did a terrific job of putting on the pressure while taking it from Anfinson. It was a hair-raising finish.

In the Novice Class, Andrew Saldate took to the track. Andrew is only three years old, and he drives

better than his dad. In a few years, this guy will really know how to handle the competition; he's a national champ in the works! Don and Dan Baligad took 1st and 2nd in the A-Main, leaving 3rd place open to Geryfer Marcelino. The Baligads aren't novices anymore; they turned more laps than most of the stock-class drivers.

Another exciting battle took place in the Pro Stock Buggy Class—this time between Craig Lair, Justin Byerly and Dominic Sellers. They pounded the rest of the field without making any mistakes. The race was close for these three, and each was ready to pounce if the leader bobbled a turn. Lair finished 3 seconds ahead of Byerly, who was followed by Sellers.

The trucks were out in force at this event, and these races were extremely popular with the spectators. In the Stock Class, Brian Peterson dominated the field, and he finished a lap ahead of the pack. Billy Bradford captured 2nd, with Kenny Burt only 1 second behind in 3rd. The Modified Class saw fast action by Ron Rossetti, who ran away with 1st place. He finished 7 seconds ahead of 2nd-place finisher Cliff Montgomery. Billy Bradford took 3rd.

Many of the Naval personnel at the Welcome Home Race showed their stuff as drivers—some even won in a few Mains. This successful event was a wonderful way to salute the troops, and *R/C Car Action* is proud to pay them tribute. Thanks go to Commander Bassett and Dan Moynihan for their efforts to promote our great sport. ■



*The Naval Color Guard displays the Stars and Stripes during the opening ceremonies.*

## TRX-1

(Continued from page 118)

Horsepower was provided by a Trinity\* Pushed 6-cell SCR pack (1400mAh) and a Trinity Speed Metal 12-turn triple motor. Voltage control fell to a Tekin Electronics\* TSC-411P speed controller. All was ready!—except, of course, for the body.

### LOVE/HATE... WHAT'S THE DIFFERENCE?

The body that comes with the TRX-1 is one that you either hate or love. I'll just say that it's, well, *unique*, to say the least. It doesn't have any really rigid lines to it, so I had a hard time figuring out a paint scheme. Fortunately, salvation (well, Motion Graphics\*) was just a "Fed-Ex" away. After Richard Muise had worked his magic, I couldn't believe how different the body looked—definitely lends itself well to a flame motif.

### DRIVING IMPRESSIONS

I took the TRX-1 for its first test-drive at the infamous Queens Off-Roaders indoor track, which is a big (only nine laps in 4 minutes) course covering a 160x57-foot area. When packed down, its clay/sand

(Continued on page 130)

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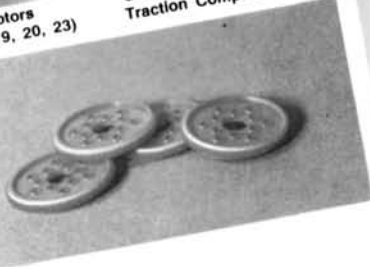


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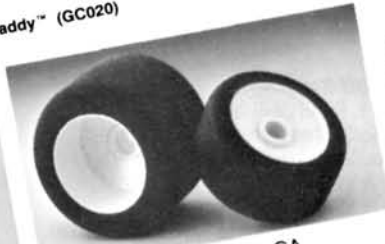


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## TRX-1

(Continued from page 129)

surface affords only marginal traction. Fortunately, the entire track was brand-new and soft.

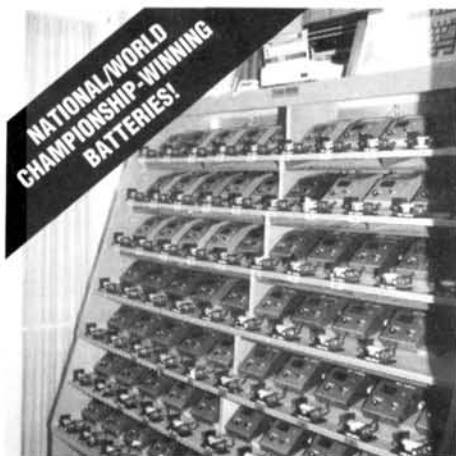
Without having had the luxury of making a few practice runs, I stood in the drivers' stand and awaited the tone that signalled the start of the first qualifying heat. Off the line, the TRX-1 tracked straight and accelerated briskly, the kit's rear tires provided plenty of bite. With Team Losi\* HT ribbed tires up front, the car handled the corners very well.

The most noticeable effects of the car's front-end design were its high degree of lateral (side-to-side) stability and its considerable front-end "dive" when cornering and braking. This "dive" transfers a greater percentage of the car's weight to the front tires, and this increases their traction. As for the rear suspension, I found it worked best with heavier damping, and the extra-long rear A-arms make the car push slightly when leaving turns (in most instances, a desirable quality).

So, how did the new TRX-1 do during its first competitive outing? We won the Stock A-Main and finished 2nd in the

(Continued on page 138)

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## TRACK REPORT

A S S O C I A T E D

**W**HAT DOES IT TAKE to win a world championship? Talent and hard work are important, but so is having the best equipment. For more than a decade, one manufacturer's 1/12-scale cars have captured the World Championships—Associated\*. This global conquest began when Kent Clausen used an RC12i to dominate the '82/'83 Worlds. Tony Neisinger also used one for his '84/'85 win, and then he piloted an RC12L to victory in the '86/'87 event. Masami Hirosaka finished the decade in style with an RC12L sweep of the top four positions at the '88/'89 Worlds. In 1990, Chris Doseck led a top-three Associated sweep and kicked off what could be another decade of domination by Associated. The company's new 1/12-scale car—the RC12LW—

is the production version of the car that Doseck used to win the '90/'91 IFMAR World Championships in Singapore.



### THE KIT

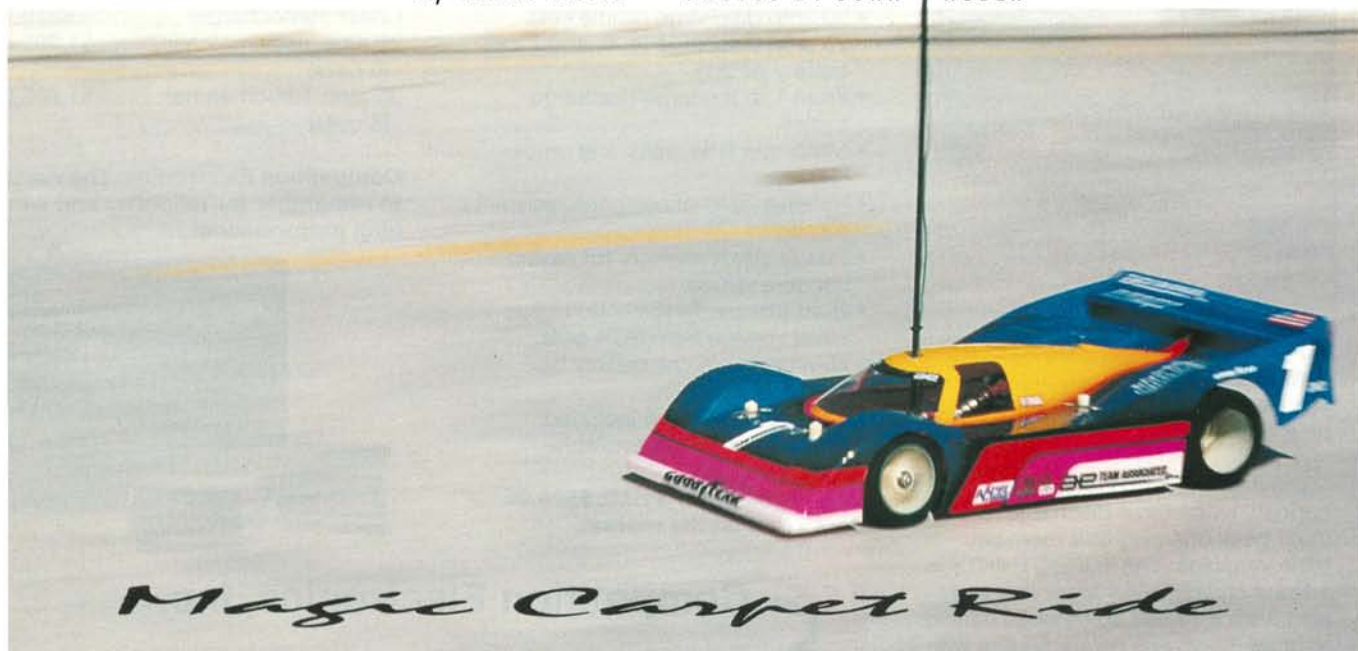
At first glance, there wasn't much difference between the RC12L and the full-blown graphite version of the RC12LW. After closely comparing the new car with an RC12L that I built in 1990, the differences were apparent.

The front ends of the two cars are identical except for the graphite suspension-arm brace that's used on the 12LW. It prevents the suspension arms from flexing under heavy loads. Moving rearward, I noticed that the battery slots were further inboard, toward the center of 12LW. (Putting the weight in this location improves the car's steer-

*(Continued on page 135)*

# RC 12 LW

by WALLY DAVID • PHOTOS BY JOHN HUBER



*Magic Carpet Ride*



## SPECIFICATIONS

Manufacturer ..... Associated  
 Type ..... On-road  
 Scale ..... 1/12  
 Price ..... \$245

### DIMENSIONS:

Overall length ..... 9.75 inches  
 Width ..... 6.80 inches  
 Wheelbase ..... 7.34 inches  
 Front track ..... 5.13 inches  
 Rear track ..... 5.25 inches

### WEIGHT:

Gross (with battery) ..... 32.34 ounces

### BODY:

Type ..... Nissan GTP\*  
 Material ..... Polycarbonate

### CHASSIS:

Type ..... Pan  
 Material ..... Graphite

### DRIVE TRAIN:

Primary ..... Pinion/spur  
 Transmission ..... None  
 Differential(s) ..... Ball  
 Bearings/Bushings ..... Ball bearings

### SUSPENSION:

Front: Type ..... Suspension arms  
           Damping ..... Coil-spring  
 Rear: Type ..... T-plate  
           Damping ..... Oil-filled, coil-over/pressure plates

### WHEELS:

Front: Type ..... One-piece nylon  
           Dimensions (DxW) ..... 1.4x1 inches  
 Rear: Type ..... One-piece nylon  
           Dimensions (DxW) ..... 1.4x1.5 inches

### TIRES:

Front/Rear ..... Green-dot foam

### ELECTRICS:

Motor\* ..... Not included  
 Battery\* ..... 4 or 6 cells\*  
 Speed controller\* ..... Not included

### OPTIONS AS TESTED:

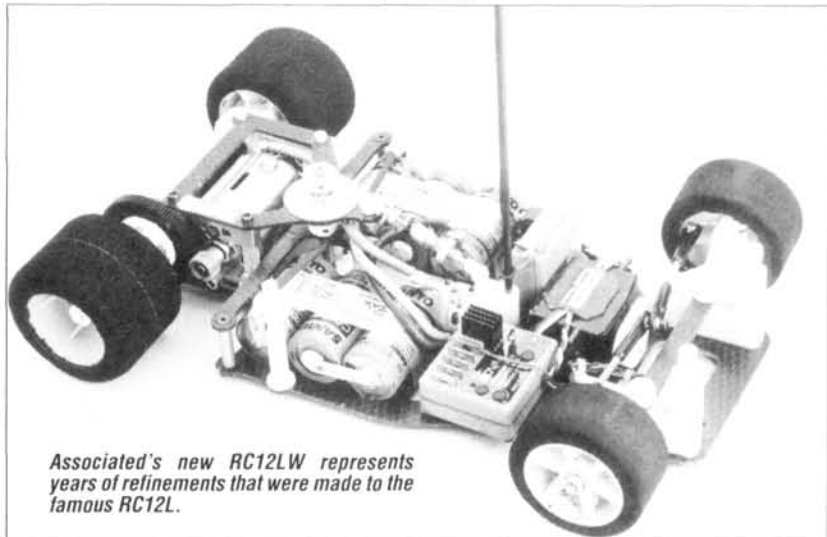
Novak 410-M1c ESC and NER-2X mini-receiver;  
 Reedy TRU stock motor; Futaba Magnum Junior  
 radio and S132H servo; Bullet Enterprises 6-cell  
 SCR pack; Bud's ceramic diff rings; Du-Mor 64-  
 pitch spur gear; Hyperdrive Platinum Lite pinion  
 gear.

### COMMENTS:

As expected, the RC12LW handled like a champ. By moving the battery closer to the car's center, Associated has improved the car's steering response. The rear cross-brace (similar to that used on the 10LSS) makes the chassis stiffer. The rear shock absorber avoids the spring oscillation that's a problem in the earlier RC12 cars.

\* not included

# RC 12 LW



*Associated's new RC12LW represents years of refinements that were made to the famous RC12L.*

ing response.) Because of this new battery layout, several modifications were made to the rear end. It has a rear chassis brace, redesigned upper and lower motor-pod braces, a two-piece rear damper tube and a narrower T-bar. Taking a page from the RC10L's book, Associated also gave the 12LW an oil-filled, coil-over shock.

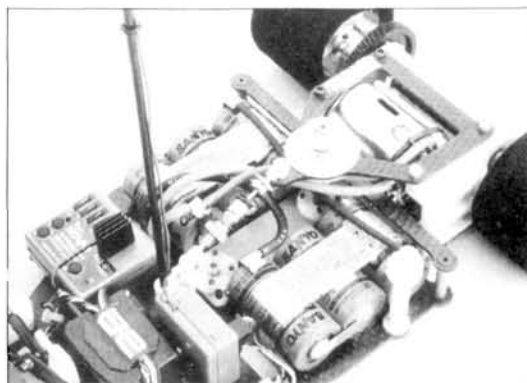
## PUTTING IT TOGETHER

The RC12LW's assembly manual is of the high quality that I've come to expect from Associated. I'd like to see all manuals include full-size illustrations of the nuts and bolts that come with the kit. Being able to match the hardware to a picture would make life much easier. Although this manual doesn't have such illustrations, the sizes of the hardware vary greatly, and finding the right piece for the job at hand isn't a problem. The manual does, however, have very clear reference photos that accompany well-written directions.

First, prepare the RC12LW's graphite chassis, i.e., file the edges of the battery slots and any other chassis parts that will come in con-

tact with the strapping tape. (As an extra precaution, you can also cover such areas with electrical tape.) Don't make the mistake of not doing this. I neglected this step on the first graphite car I ever assembled and, during the first test run, its electronics shorted when its chassis cut through the shrink-wrap on the batteries. It was a very expensive mistake.

The front-end assembly is straightforward: bolt the nylon suspension-arm/steering-block assem-

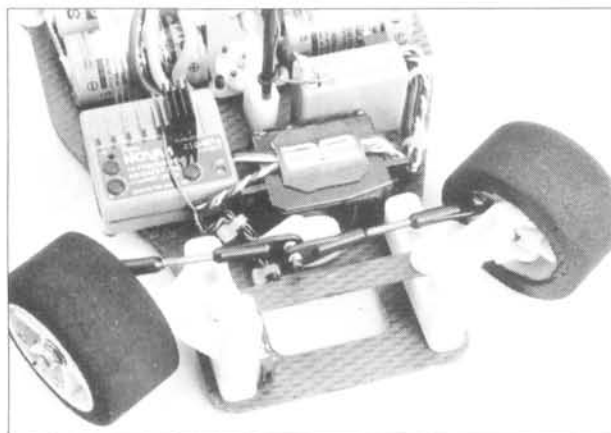


*Things can get tight when you use six cells in a 1/12-scale car. Novak's tiny receiver and 410-M1c speed controller make the job easier.*

blies to the chassis. (The new graphite suspension-arm brace will really make the front end more rigid.)

The stock front axles on the RC10L, RC12L and the RC12LW use E-clips to hold the wheels on the car. More than once, I've seen front

# RC 12 LW



*The RC12LW's front end isn't very different from that of the RC12L. To secure the wheels, I replaced the stock front axles with Bolink's threaded axles and ball-end steering linkages.*

wheels sail off a car because the E-clips had popped off. Now, this may have been the racer's fault (perhaps he didn't check that the clips were fully seated on the axle), but to avoid this problem, I replace the stock axles on these cars with Bolink's\* threaded front axles. They fit right into the Associated steering blocks, and the wheels are secured with locknuts.

Inside each of the front wheels, I use one of Bud's Racing Products'\* Crush Sleeves. One sleeve fits between the wheel bearings, and it enables the wheel to spin freely even after you've tightened the axle nut.

Take care when you attach the two socket ball-pivot assemblies to the narrow T-bar. Be sure to position the plastic pivot sockets exactly as shown in the photograph. I didn't pay attention to which direction the "T" part of the bar faced, and I had to take everything off and start over. (You see, I make all these mistakes, so you won't have to. I'm such a nice guy!)

The front socket ball isn't supposed to swivel, so it can fit snugly in the pivot socket. The rear pivot ball must swivel freely, however, so don't overtighten the screws because they might strip the plastic. If it doesn't swivel freely after you've assembled it and attached it to the T-bar, there are two things you can do. It's easiest to loosen each screw

by a quarter of a turn. The manual, however, recommends that you take out the ball, secure it to a 4-40 screw and a locknut, and then turn the screw in a drill press and polish it with crocus cloth or fine-grit sandpaper. This should enable the ball to swivel freely, but not loosely. If you're as lucky as I was with this step, the ball won't need extra attention to swivel correctly.

Assembling the motor pod, of which the T-bar is a part, isn't difficult. You attach the pod to the chassis using two screws that pass through the pivot balls. Secure the front screw with a locknut, and insert the rear one in the short, threaded, aluminum post. Thread a long setscrew half-

way into the top part of the post, and put the rear brace over the setscrew. Then, thread the longer aluminum post onto the setscrew until the post is snug against the brace. Next, put a series of damping washers and collars onto the post and secure them with small setscrews. The ends of the brace are held in place by two aluminum posts on the outside of the chassis. The brace stiffens the rear suspension and helps avoid the flexing problem that occurs on the RC12L, which uses a one-piece damping tube.

Assembling the small oil-filled, coil-over shock is probably the most critical—and the most difficult—part of this project. First, trim the

**The "W" in RC12LW stands for "Worlds," and this car really lives up to its name.**

## DIFFERENTIAL DECISIONS

For a differential to operate properly, you must make sure that the diff rings don't slip. Although the RC12LW's instructions don't tell you how to avoid such slippage, there are several ways to combat it. The easiest way is to affix the rings with CA. I don't advise this because, when you want to replace them, the glue will prevent the new rings from sitting perfectly flat.



RCPS\* makes traction rings that you glue to the diff ring. One side of each traction ring is abrasive, and this prevents slippage. Since you don't glue the diff rings themselves to the hubs, replacing them is easy. Another option is to use Hyperdrive's Hyperrings, and you don't need to secure them with CA. Each ring has an abrasive side, which contacts the hub and the axle and prevents slippage, and a smooth side, on which the diff balls ride.

Magic Motorsports\* offers notched, high-carbon-steel diff rings that you pin to the axles and the diff hubs. Using the ring as a template, mark the spot where the pin will go through the axle and the hub. Remove the ring, and then carefully drill a 1/16-inch-diameter hole in the axle and hub. Be sure to use a drill press; it's important *not* to drill the hole at an angle. Next, cut a 1/4-inch-long piece of 1/16-inch piano wire, and insert it into the hole so that its top is flush with the surface of the ring. Trim the excess wire that protrudes through the back of the axle and the hub, and secure the wire with CA.

For the review of the RC12LW, I used ceramic diff rings from Bud's Racing Products. The two white rings come with a set of precision diff balls, two plastic pins and good directions.

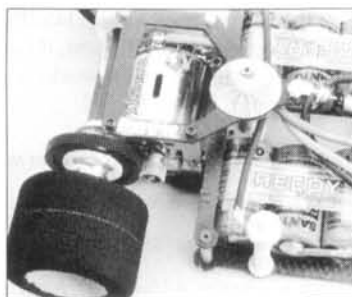
The ceramic rings enable the diff to operate very smoothly, and they're economical. The rings are supposed to be extremely durable. Bud Bartos once told me that a set of prototypes was used for more than 200 4-minute runs without showing signs of wear. The rings cost \$24; divide this by 200, and it works out to a cost of 12 cents for each run. The average cost of a set of diff rings is \$5 and, if you replaced them after 20 runs (far more runs than the top drivers would recommend), the cost of each run would be 25 cents. Even if you only got 150 runs with the ceramic rings, the cost for each run would still be less (16 cents).

Ceramic diff rings are, however, slightly thicker than standard ones. This causes the right rear side of the car to shift away from the center line. You'll have to add spacers to the left rear hub so that the rear wheels will be equidistant from the center line.



two plastic ball cups to 11mm, and then screw the spring-adjustment collar onto the shock body. Be very careful not to cross-thread the collar, because the threads are very fine. Slip the red rubber O-ring and the black plastic washer onto the shock piston.

Put aside the assembled shaft,



*I replaced the stock metal diff rings with Bud's ceramic rings. Because they're slightly thicker, you have to adjust the rear track slightly.*

the black plastic endcap and the small spring, and hold the shock body nearly upright. Slowly pour the supplied 20WT oil into it and, to prevent air bubbles, let the oil run down the inside wall. Fill the shock body up to the bottom threads, slowly push the shaft assembly into it, and then slip the spring and the plastic endcap onto the shaft. The instructions warn you (in big, bold letters) to "...be careful here. Slowly screw the plastic endcap into the cylinder twice, as shown in Fig. 44." Well, I'll say it again; *be careful here*. I was so busy trying not to cross-thread the cap, I didn't realize that I hadn't screwed it in at all.

When I let go of it, the cap and the spring ricocheted all over my living room. The shock assembly ground to a halt while I searched for the two pieces; it was three days before I found them. (The spring was sitting on the door frame, and the cap was in the opposite corner of the room.)

The bleeding process (outlined in the manual) is the most important shock-assembly step. You may

*(Continued on page 204)*

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## TRX-1

(Continued from page 130)

Modified (behind Mike Ericksen, who's the ROAR Region 1 Modified Champ)—not bad for a brand-new car that I'd never driven before!

### THE VERDICT

I'm sure that there's one question on the mind of anyone who has heard of this car: is the TRX-1 a real contender, or is it merely a clone of the current crop of high-performance 2WD race cars? Well, in my opinion, Traxxas's new car is capable of the highest level of performance. It can be called *derivative*, but I think that it's original enough to escape that classification; and even if, to many of you, it *isn't*, the fact of the matter is that it works *well*, and that's enough for me!

*\*Here are the addresses of the companies mentioned in this article:*

**Traxxas Corp.**, 12150 Shiloh Rd., #120, Dallas, TX 75228.

**Associated Electrics Inc.**, 3585 Cadillac Ave., Costa Mesa, CA 92626.

**Futaba Corp. of America**, 4 Studebaker, Irvine, CA 92718.

**Novak Electronics Inc.**, 128-C E Dyer Rd., Santa Ana, CA 92707.

**Trinity Products Inc.**, 1901 E Linden Ave., Linden, NJ 07036.

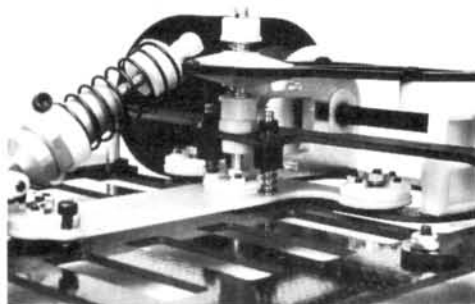
**Tekin Electronics**, 970 Calle Negocio, San Clemente, CA 92672.

**Motion Graphics**, 2645 Robert Arthur Rd., Westminster, MD 21157.

**Team Losi**, 13848 Magnolia Ave., Chino, CA 91710. ■

## FLEX REAR END (PRO) #PS35

Cheetah Racing is proud to introduce this mono-ball mounted rear end for the Associated 10L/SS10L. This design completely eliminates T-Bar up and down flexing while retaining the lateral (side to side) flex properties. Dampening is now controlled by the **shock absorber**.



### PRODUCT FEATURES:

- Mono-ball mounted rear pod
- Over-sized damper washer area on the top brace for constant dampening in all pod positions
- Threaded Center Post for precise, non-slip dampening adjustments
- Threaded Post Brace/T-Bar Springs Combination
- T-Bar Springs control body roll without interfering with dampening washer setting
- Chassis tweak achieved in standard fashion. (Tweak screws).

FLEX REAR END (PRO) .....#PS35 FLEX REAR END .....PS39  
(Minus Threaded Post #PS02 T-Bar Springs  
#PS42 and Center Post Brace #PS40).

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## HONDA NSR 500

(Continued from page 41)

wheels, it will tip over when it's standing still—just like the real thing! It takes practice to learn how to handle the bike well, but fear not; it can be mastered in only a couple of runs. When it's moving at higher speeds, the bike is extremely stable because a metal flywheel inside the front tire acts as a gyro to keep it upright.

Rather than *turning* the front wheel to the left or the right, the steering servo makes the front forks and wheel swing off center either to the left or the right. The front fork is set up to turn freely on the kingpin. Swinging the front forks and wheel off center makes the bike lean. That, in turn, causes the bike to turn in the direction in which it's leaning. This makes the bike look realistic: it leans into curves as it turns. The front wheel tends to stabilize at higher speeds so, as the bike travels faster, a more pronounced leaning will be necessary to make a turn of the

(Continued on page 150)



# Racing Servo Roundup

Turning  
point!

by JOHN HUBER

**C**HOOSING THE right steering servo for your car might not be something that you give much consideration but, when you think about it, it's an important decision: the steering servo is what guides your car! Sure, all of them move back and forth, but how *well* do they do this under driving conditions?

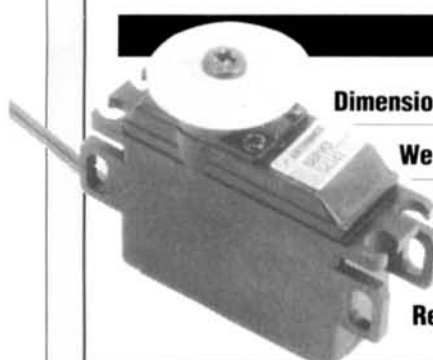
A good servo should have plenty of torque so that it can position itself positively even under the extreme loads imposed by tires. The servo's speed (i.e., transit time) is also a consideration because it affects the car's sensitivity to your commands.

It used to be hard to find a servo with sufficient speed *and* torque, i.e., the faster it was, the less torque it had and vice versa. Depending on your needs, you either bought a fast servo that was weak or a slow servo that was powerful. Technological advancements, however, have given us the best of both worlds.

The servos listed here cover the entire spectrum of R/C car and truck applications—from the basic to the outrageous. Whatever your needs (or your budget), there's a servo here that will suit them!

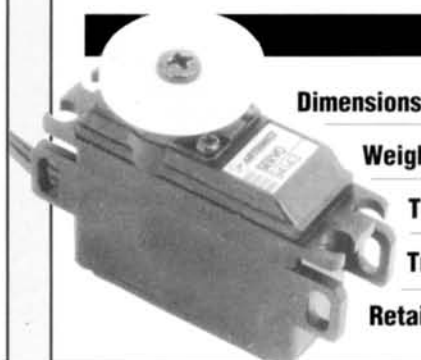
## A I R T R O N I C S

(All servos shown actual size)



**94141**

<b>Dimensions</b>	1.37x0.60x1.27 in.
<b>Weight</b>	1.18 oz.
<b>Torque</b>	45 oz./in.
<b>Transit Time</b>	0.25 sec./60°
<b>Retail Price</b>	\$79.95



**94143**

<b>Dimensions</b>	1.37x0.60x1.27 in.
<b>Weight</b>	1.08 oz.
<b>Torque</b>	32 oz./in.
<b>Transit Time</b>	0.08 sec./60°
<b>Retail Price</b>	\$79.95



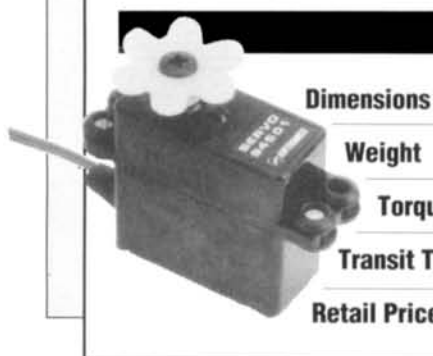
**94151**

<b>Dimensions</b>	1.55x0.80x1.50 in.
<b>Weight</b>	1.90 oz.
<b>Torque</b>	75 oz./in.
<b>Transit Time</b>	0.08 sec./60°
<b>Retail Price</b>	\$129.95



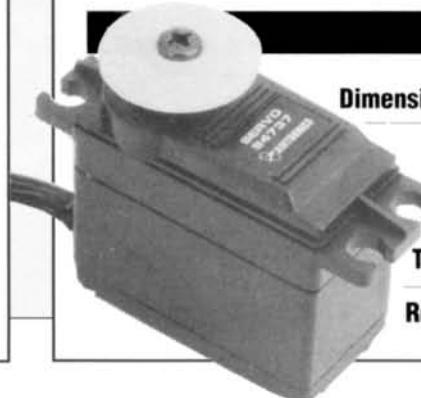
**94152**

<b>Dimensions</b>	1.55x0.80x1.50 in.
<b>Weight</b>	2.40 oz.
<b>Torque</b>	105 oz./in.
<b>Transit Time</b>	0.12 sec./60°
<b>Retail Price</b>	\$139.95



**94501**

<b>Dimensions</b>	1.06x0.49x1.06 in.
<b>Weight</b>	0.65 oz.
<b>Torque</b>	20 oz./in.
<b>Transit Time</b>	0.5 sec./90°
<b>Retail Price</b>	\$79.95



**94737**

<b>Dimensions</b>	1.55x0.80x1.40 in.
<b>Weight</b>	1.9 oz.
<b>Torque</b>	55 oz./in.
<b>Transit Time</b>	0.15 sec./60°
<b>Retail Price</b>	\$99.95

# Racing Servo Roundup

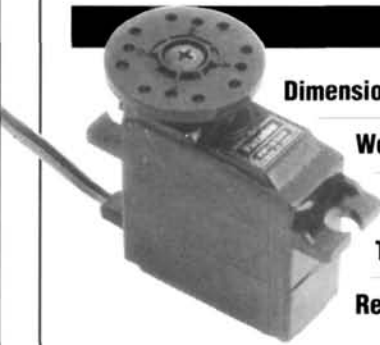
## A I R T R O N I C S



**94738**

<b>Dimensions</b>	1.55x0.80x1.40 in.
<b>Weight</b>	1.9 oz.
<b>Torque</b>	75 oz./in.
<b>Transit Time</b>	0.18 sec./60°
<b>Retail Price</b>	\$79.95

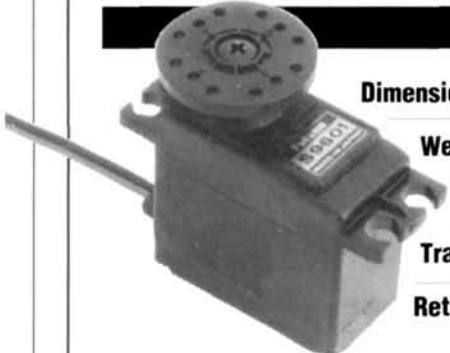
## F U T A B A



**FP S133**

<b>Dimensions</b>	0.50x1.06x1.12 in.
<b>Weight</b>	0.6 oz.
<b>Torque</b>	27.8 oz./in.
<b>Transit Time</b>	0.22 sec./60°
<b>Retail Price</b>	\$59.95

## F U T A B A



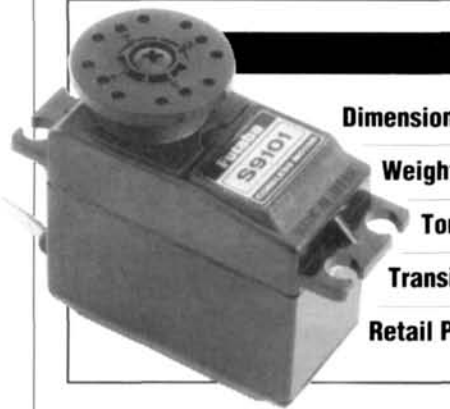
**S9601**

<b>Dimensions</b>	0.62x1.21x1.18 in.
<b>Weight</b>	1.1 oz.
<b>Torque</b>	36.1 oz./in.
<b>Transit Time</b>	0.17 sec./60°
<b>Retail Price</b>	\$79.95



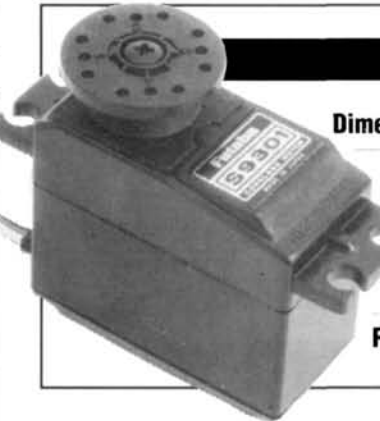
**S132 H**

<b>Dimensions</b>	0.68x1.43x1.18 in.
<b>Weight</b>	1.1 oz.
<b>Torque</b>	25 oz./in.
<b>Transit Time</b>	0.13 sec./60°
<b>Retail Price</b>	\$54.95



**S9101**

<b>Dimensions</b>	0.77x1.52x1.36 in.
<b>Weight</b>	1.5 oz.
<b>Torque</b>	41.7 oz./in.
<b>Transit Time</b>	0.17 sec./60°
<b>Retail Price</b>	\$79.95

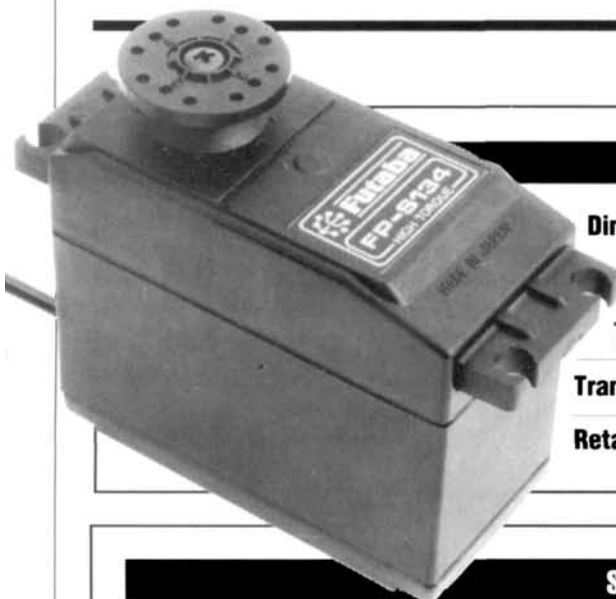


**S9301**

<b>Dimensions</b>	0.79x1.59x1.40 in.
<b>Weight</b>	1.7 oz.
<b>Torque</b>	69.5 oz./in.
<b>Transit Time</b>	0.22 sec./60°
<b>Retail Price</b>	\$79.95



# F U T A B A



## FPS134

<b>Dimensions</b>	1.14x2.32x1.97 in.
<b>Weight</b>	2.7 oz.
<b>Torque</b>	112.6 oz./in.
<b>Transit Time</b>	0.22 sec./60°
<b>Retail Price</b>	\$64.95

## S3302

<b>Dimensions</b>	1.14x2.32x1.97 in.
<b>Weight</b>	3.6 oz.
<b>Torque</b>	110 oz./in.
<b>Transit Time</b>	0.19 sec./60°
<b>Retail Price</b>	\$79.95

## S3002

<b>Dimensions</b>	0.62x1.21x1.18 in.
<b>Weight</b>	1.8 oz.
<b>Torque</b>	44 oz./in.
<b>Transit Time</b>	0.16 sec./60°
<b>Retail Price</b>	\$79.95

## S9302

<b>Dimensions</b>	0.79x1.59x1.55 in.
<b>Weight</b>	2.3 oz.
<b>Torque</b>	99 oz./in.
<b>Transit Time</b>	0.19 sec./60°
<b>Retail Price</b>	\$99.95

## S9401

<b>Dimensions</b>	0.79x1.59x1.40 in.
<b>Weight</b>	1.8 oz.
<b>Torque</b>	44 oz./in.
<b>Transit Time</b>	0.16 sec./60°
<b>Retail Price</b>	\$79.95

## S5102

<b>Dimensions</b>	0.50x1.06x1.12 in.
<b>Weight</b>	0.8 oz.
<b>Torque</b>	27.8 oz./in.
<b>Transit Time</b>	0.22 sec./60°
<b>Retail Price</b>	\$79.95

# J R R E M O T E C O N T R O L

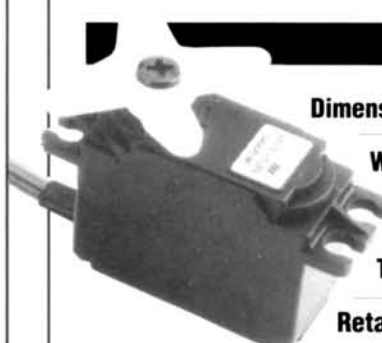
## 517

<b>Dimensions</b>	1.29x0.75x1.54 in.
<b>Weight</b>	1.72 oz.
<b>Torque</b>	40.3 oz./in.
<b>Transit Time</b>	0.27 sec./60°
<b>Retail Price</b>	\$39.95



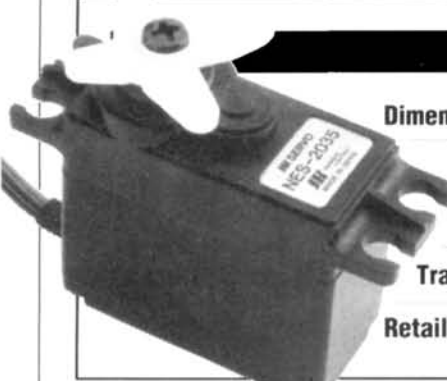
## 3021

<b>Dimensions</b>	1.02x0.58x1.3 in.
<b>Weight</b>	0.84 oz.
<b>Torque</b>	41.7 oz./in.
<b>Transit Time</b>	0.25 sec./60°
<b>Retail Price</b>	\$74.95



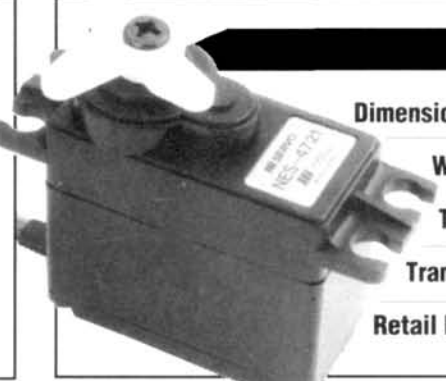
# Racing Servo Roundup

## J R R E M O T E C O N T R O L



**2035**

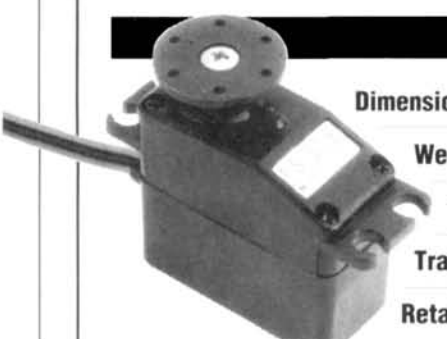
<b>Dimensions</b>	1.29x0.75x1.54 in.
<b>Weight</b>	1.61 oz.
<b>Torque</b>	47.2 oz./in.
<b>Transit Time</b>	0.19 sec./60°
<b>Retail Price</b>	\$79.95



**4721**

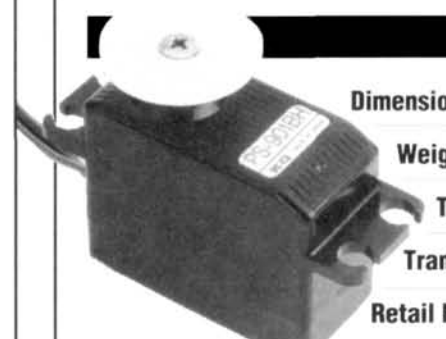
<b>Dimensions</b>	1.29x0.75x1.38 in.
<b>Weight</b>	1.72 oz.
<b>Torque</b>	119.4 oz./in.
<b>Transit Time</b>	0.22 sec./60°
<b>Retail Price</b>	\$79.95

## K O P R O P O



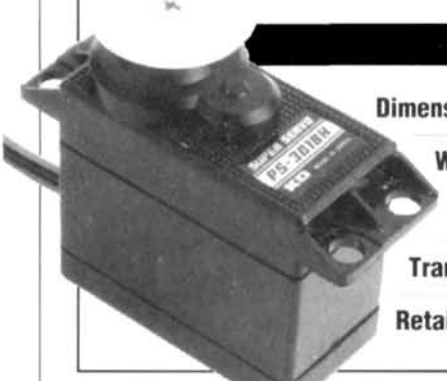
**PS 51S**

<b>Dimensions</b>	1.13x1.18x0.63 in.
<b>Weight</b>	0.81 oz.
<b>Torque</b>	19.7 oz./in.
<b>Transit Time</b>	0.20 sec./70°
<b>Retail Price</b>	\$54.95



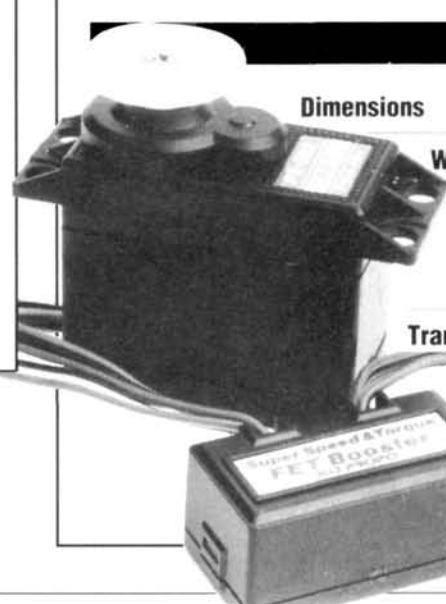
**PS 901 BH**

<b>Dimensions</b>	1.42x1.18x0.70 in.
<b>Weight</b>	1.20 oz.
<b>Torque</b>	25 oz./in.
<b>Transit Time</b>	0.19 sec./60°
<b>Retail Price</b>	\$54.95



**PS 301 BH**

<b>Dimensions</b>	1.57x1.34x0.83 in.
<b>Weight</b>	1.59 oz.
<b>Torque</b>	34 oz./in.
<b>Transit Time</b>	0.45 sec./60°
<b>Retail Price</b>	\$49.95



**PS 302 FET**

<b>Dimensions</b>	0.83x1.38x0.61 in.
<b>Weight</b>	1.94 oz.
<b>Torque</b>	69.3 oz./in. (@7.2V); 80.6 Oz./in. (@8.4V)
<b>Transit Time</b>	0.12 sec./60° (@7.2V); 0.10 sec./60° (@8.4V)
<b>Retail Price</b>	\$79.95

\*Here are the addresses of the companies featured here:  
**Airtronics Inc.**, 11 Autry, Irvine, CA 92718.  
**Futaba Corp. of America**, 4 Studebaker, Irvine, CA 92718.  
**JR Remote Control**, distributed by Hobby Dynamics Distributors,  
 P.O. Box 3726, Champaign, IL 61826.  
**KO Propo**, distributed by Global Hobby Distributors, 10725 Ellis Ave.,  
 Fountain Valley, CA 92728.





# 1991 ROAR-LEGAL STOCK-MOTOR SHOOTOUT

**I**N R/C RACING, controversies come and go, but one of the most enduring has been that concerning stock-class racing and, more specifically, its motors.

By its name, stock-class racing implies that every racer competes on equal ground. Ideally, each car should be similarly equipped, making chassis-tuning skills and superior driving ability the difference between winning and losing. In past years, the rules governing the motors used for this class were loosely regulated. Although they ensured that all motors contained similar components, i.e., the can, the magnet, the armature and the windings, there was no regulation of how these components were assembled. For example, changing the position of the

commutator in relation to the armature results in a change of timing that can drastically alter a motor's performance. When motor manufacturers began to notice that increased timing meant increased sales, they fueled the controversy further with fast, but short-lived, motors.

Manufacturers engaged in contests of one-upmanship by always trying to increase the timing of their stock

motors more than their competitors increased theirs. The "motor of the week" was the one with the highest degree of timing, and that's no exaggeration; there was a new one every week. At the peak of the stock-motor wars, motor timing had soared from a modest 12 degrees to a ridiculous 45 degrees.

A landmark decision by ROAR (Radio Operated Auto Racing), the largest sanctioning organization in the U.S., made great

strides toward eliminating the controversy. ROAR required that the timing on stock-class motors be limited to a maximum of 24 degrees as of the 1991 racing season. Furthermore, it ruled that every motor must include a commutator-locking device to prevent the tampering that had become so common.

It took time for manufacturers to react to these changes, but most, if not all, have come to the table with new, ROAR-legal, 24-degree stock motors.

I obtained five representative motors; every motor on the market resembles one of the five tested here.

I tested:

- Kyosho's ROAR '91
- Reedy's Yokomo-based Tru-Stock
- Trinity's Slot Machine
- Speedworks' Boss
- HPI's UNO Stock.

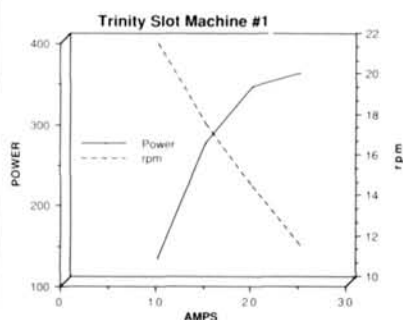


by STEVE POND

# 1991 ROAR LEGAL STOCK MOTOR SHOOTOUT



**TRINITY**

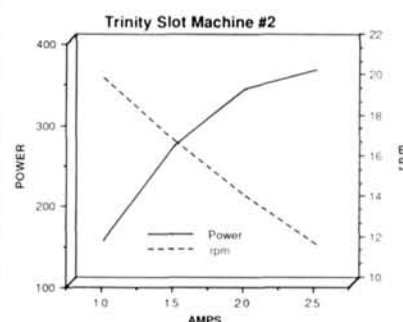


**Slot Machine #1**

Amps	Power	rpm
10	131	21,900
15	273	17,900
20	343	14,800
25	360	11,900

Efficiency rating: 2.8

Ideal current draw: 17.53 amps



**Slot Machine #2**

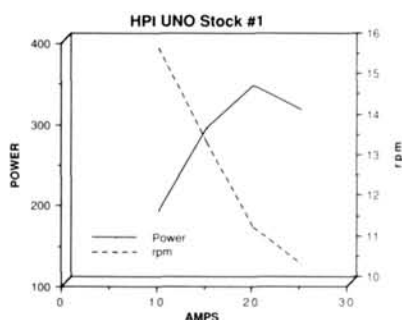
Amps	Power	rpm
10	154	20,200
15	272	17,100
20	341	14,400
25	364	12,000

Efficiency rating: 2.77

Ideal current draw: 16.9 amps



**HPI**

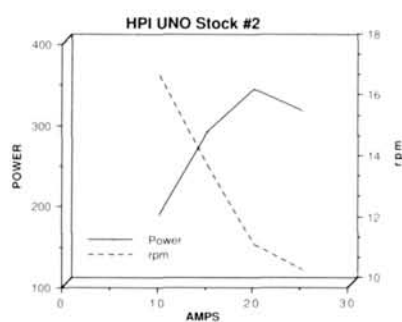


**Uno Stock #1**

Amps	Power	rpm
10	190	15,800
15	291	13,500
20	344	11,400
25	315	10,500

Efficiency rating: 3.0

Ideal current draw: 14.08 amps



**Uno Stock #2**

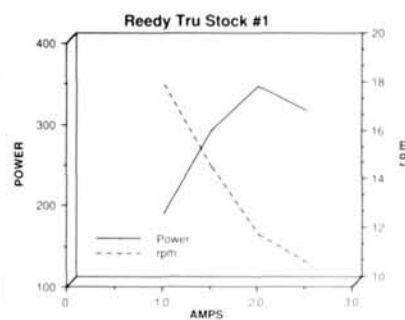
Amps	Power	rpm
10	186	16,900
15	289	13,900
20	341	11,300
25	315	10,500

Efficiency rating: 2.97

Ideal current draw: 14.24 amps



**REEDY**

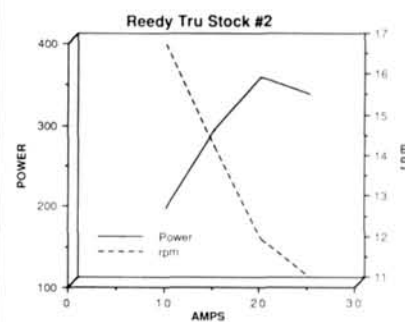


**Tru-Stock #1**

Amps	Power	rpm
10	187	18,200
15	289	14,800
20	343	12,000
25	314	10,900

Efficiency rating: 2.98

Ideal current draw: 14.24 amps



**Tru-Stock #2**

Amps	Power	rpm
10	194	16,900
15	290	14,400
20	355	12,100
25	335	11,200

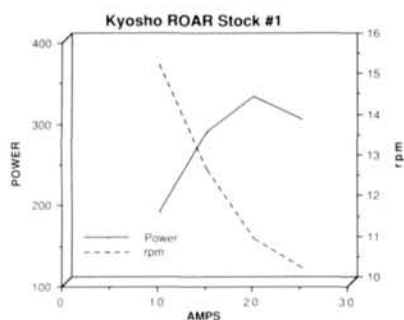
Efficiency rating: 3.01

Ideal current draw: 14.32 amps





## KYOSHO

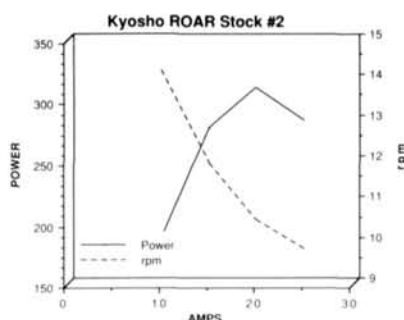


### ROAR '91 Stock #1

Amps	Power	rpm
10	188	15,400
15	287	12,800
20	330	11,100
25	303	10,400

Efficiency rating: 2.94

Ideal current draw: 13.77 amps



### ROAR '91 Stock #2

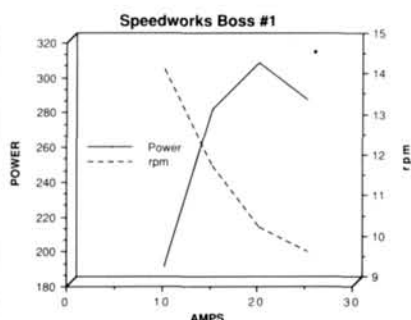
Amps	Power	rpm
10	186	14,300
15	279	12,000
20	312	10,600
25	285	9,900

Efficiency rating: 2.85

Ideal current draw: 13.22 amps



## SPEEDWORKS

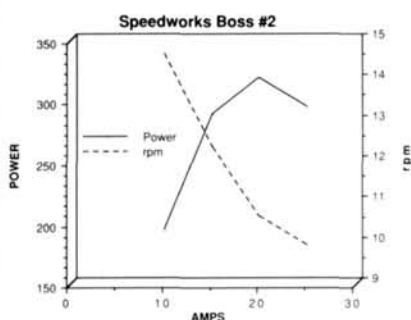


### Boss #1

Amps	Power	rpm
10	190	14,300
15	280	11,900
20	307	10,400
25	286	9,800

Efficiency rating: 2.86

Ideal current draw: 12.6 amps



### Boss #2

Amps	Power	rpm
10	199	14,700
15	290	12,400
20	320	10,700
25	296	9,800

Efficiency rating: 2.98

Ideal current draw: 12.52 amps

Before I tested them, I broke-in each motor (two of each motor listed) using the brushes and springs that came with it. (ROAR rules allow racers to change the brushes and springs, but I decided to test the motors as they came.) Using Lavco's Pro Dyno, I tested each motor at 10-, 15-, 20- and 25A loads. The data and the graphs were generated directly from the Pro Dyno's data. The data include the power and rpm readings at each load setting, an ideal current draw for each motor and an efficiency rating at that rpm. Motors with the highest rpm and power rating are preferred. The efficiency rating is fairly important, but if a motor runs at its ideal rpm, duration shouldn't be a problem especially with stock motors.

### WHAT DOES IT MEAN?

The Lavco Pro Dyno measures two things—power and rpm. Each measurement is taken at four load settings: 10, 15, 20 and 25 amps.

• **The power rating.** This indicates the efficiency of the motor. Of two motors that yield the same rpm rating, the motor with the higher power rating is more desirable because its performance will be more efficient. Also, the higher the power rating, the faster the motor will accelerate.

• **The rpm rating.** When used with the power rating, this reading will help you to determine the proper gearing. Two motors with identical power ratings but different rpm ratings must be geared differently to attain the same axle speed.

In addition to these two ratings, we included the ideal current draw in the data. This is the current level at which the motor operates at peak efficiency. On the graphs, this is where the power and rpm ratings intersect.

### READING THE RESULTS

The Trinity Slot Machine triumphed. It achieved the highest power rating at the 25A setting and the highest rpm throughout the entire range of load settings. The Reedy Tru-Stock was our 2nd-place finisher, followed closely by HPI's UNO stocker. Fourth and 5th place went to the Kyosho ROAR '91 and the Speedworks Boss, respectively.

# TRUCK STOP

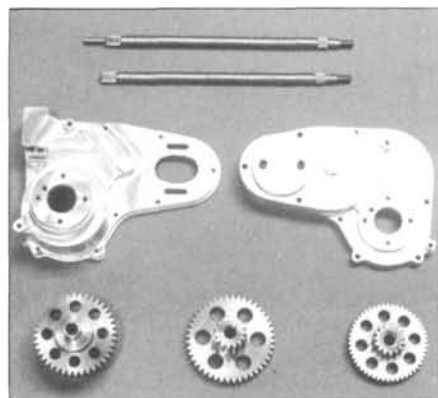
by DAVE SPROUL

## Bulletproof your gearbox

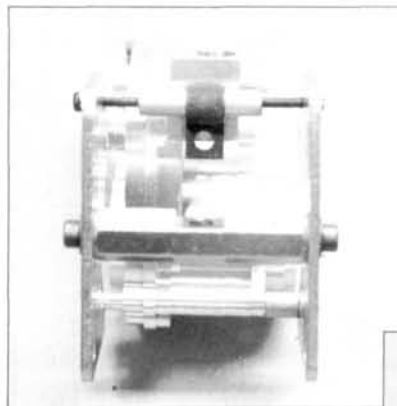
IN THIS edition of "Truck Stop," I'll discuss how to "bulletproof" your Clod Buster/Bullhead gearbox for R/C pulling competitions. You'll have to replace most of the original parts with after-market parts, and that's an expensive proposition, but it's an alternative to suffering broken gears, axles and/or cases.

First, I replaced the gear cases. JPS Custom Wheels\* offers a new, beautifully machined, aluminum replacement gearbox case. Its shape resembles that of the original plastic case, but it has been redesigned for cosmetic and production purposes. The JPS case is stronger than the original case, and it has an adjustable motor mount to make pinion selection easy. It can be used with the stock plastic gears or after-market gears. This case uses the original plastic axle tubes; they can be bolted to the new case without any problems. (I'm told that JPS will soon offer aluminum axle tubes.)

I have one complaint about this new gearbox: it won't easily accept the MaxTrax\* Clod Buster hitch kit. One of the mounting "ears" used on the stock gearbox to mount the hitch has been omitted from the JPS design. The bottom of the hitch bolts properly to the case, but you'll have to make an adapter bracket



Everything you need to build a bulletproof Clod Buster/Bullhead gearbox: Sassy Chassis axles, JPS gear case and EMC steel replacement gears.



● *Left: To fit the MaxTrax Clodbuster hitch to the JPS gearbox, make a bracket, or use a metal cable clamp as shown.*

● *Below: The "Missing Link" steering bellcrank from Sassy Chassis replaced a stock servo-saver/bellcrank and reduced slop in the steering system.*



for the top. I've experimented with a metal cable clamp at the top, and although it works, it's not ideal. Drill a hole in the gearbox so that you can attach the cable clamp.

### GEARS FOR FEARS

To fill the gearbox, I use precision-machined steel gears from EMC. These heavy-duty gears fit the stock gearbox as well as the originals did. When you use the EMC gears (or any steel gears for that matter), always install ball bearings. Any good-quality bearing set for the Clod Busters will work with the EMC gear set. The final-drive gear is solid (no diff), and it accepts stock axles, or any direct-replacement after-market axles designed to replace the stock units.

When I installed the EMC gears in the JPS case, I discovered that the gears fit too closely together, and this made them very difficult to turn. The stock plastic gears, however, fit and turned nicely. After a couple of phone calls to EMC and JPS, I realized that I'd have to modify the case. The case I had received for review was from the early production run, and it hadn't been modified. JPS assures me that the cases from their current production run are OK.

A strong gear case that's filled with strong gears requires equally strong axles. The stock Clod Buster/Bullhead axles break regularly in pulling competi-

tions, so the obvious choice is to replace them with Sassy Chassis'\* new two-piece steel axles. These axles are designed to replace the original units, and they'll fit the EMC gears. They also extend into the wheel hub, thereby eliminating the steering function of the rear axle.

This means you can't use these axles for the front gearbox, so the stock axles will have to suffice up front. Again, you must use ball bearings on the axle.

I noticed that, when installed in the final drive gear, the axles don't always run true because of the manufacturing tolerances. This can usually be remedied by "indexing" the axle in the gear. This is a little time consuming, but it isn't difficult. Simply remove the gear from the splined axle and rotate the axle one spline at a time, re-install the gear and spin the assembly. Do this until the axle runs true. This method usually eliminates most problems.

It may take a little time to assemble and "blueprint" the assembly, but once you've done it, you'll have one tough gearbox!

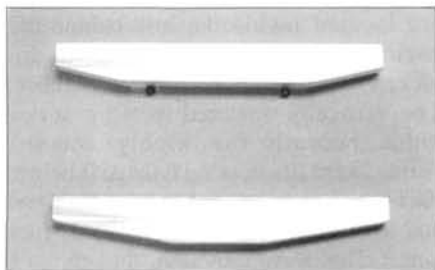
### TRUCK TOYS

In other news...Team Astro's\* Pullmaster IV motor, designed (obviously) for truck pullers, uses six turns of 19-gauge wire, has a current capacity of 50 amps, and it can handle 14 cells. It's intended for Open I competition. The armature shaft diameter is 1/4 inch, and that makes the pinions a little hard to find. Knowing Team Astro's reputation for producing durable motors, I'm sure this one is no exception.



JPS Custom Wheels offers front and rear bumpers for the Clod/Bullhead and the USA-1. Machined of light aluminum, these units come with a machined finish, but they can also be polished.

Another neat item is Sassy Chassis Missing Link, which greatly reduces steering slop. It's designed to replace the stock servo-saver/bellcranks on the Clod and the Bullhead. This fully adjustable, three-piece, aluminum bellcrank features positive locking, and it comes with all the necessary hardware. To avoid damaging



Also available from JPS are these nicely machined aluminum bumpers that are designed to fit the front and rear of the Clodbuster/Bullhead and the USA-1. They're great for adding that extra touch of realism.

the servo gears, remember to install a good-quality servo-saver on your steering servo.

In a future "Truck Stop," I'll tell you about a new aluminum gearbox from JPS for Kyosho's USA-1 and PDI's Clodilever suspension system for the Clod/Bullhead. So stay tuned, and keep the hammer down!

*\*Here are the addresses of the companies mentioned in this article:*

JPS Custom Wheels, P.O. Box 3014, Fullerton, CA 92631.

MaxTrax; distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61824.

Sassy Chassis, 906 Ridgewood Dr., Cary, IL 60013.

Team Astro/AstroFlight, 13311 Beach Ave., Marina Del Rey, CA 90292. ■

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## HONDA NSR 500

(Continued from page 138)

same radius. This is one reason why the 10-tooth pinion gear, which allows the quickest braking and acceleration, is best suited to complex courses. An optional light flywheel is available as an alternative to the metal one. With this, the bike is less stable, but more maneuverable at higher speeds.

With its finely detailed appearance but less-than-blinding speed, the Kyosho Honda NSR 500 is definitely more show than go; but so what? By designing a model that looks great, moves like a full-size bike and is a pleasure to build and run, Kyosho has remained true to what R/C is all about—having fun.

\*Here's the address of the company that's featured in this article:

Kyosho/Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61824.

## HOME-BUILT

(Continued from page 47)

radio receiver and the speed controller are located inside the box behind the engine, and the gearbox and motor are tucked neatly under the fender assembly. The vertically mounted steering servo hides beneath the highly detailed Parma Hemi (its steering linkage is below the frame). In an attempt to keep the front end low, I added a lead shot-filled "fuel tank." This wasn't enough, though, so I filled the Parma Hemi with lead shot, and re-installed it over the servo. Even so, the tractor only weighs 3.5 pounds!

It's a real handful to drive—just like the real thing! Having witnessed the big-block mini-rod pulls, however, I'd say that R/C driving is a whole lot safer!

This was a "one-off" creative model-building project, so there are no kits or plans available. If you want to build one of these, use the pictures and specifications as a guide, and let your imagination go. Meanwhile, back at the ol' workshop, another wild R/C vehicle is under construction. It's top secret for now, but I'll give you a couple of clues: it's not a truck or a tractor; it's 1/4-scale; and it might just blow you away! Intrigued? Watch for a full feature in an upcoming issue of *R/C Car Action*. I have work to do!

(Continued on page 161)

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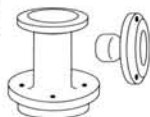
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# 'HAMMER TIME

by LOU MARCIELLA

**W**HEN I PURCHASED my Traxxas Sledgehammer kit, I was impressed with its high-quality materials: T-6 aluminum, virgin nylon and ABS engineering plastic were used throughout. The construction was simple and straightforward, and I didn't have to hand-fit any of the parts. I chose the kit version instead of the RTR (ready to run), because I knew that the things I'd learn during assembly would come in handy if I had to rebuild or replace damaged or worn parts.



# Sledgehammer

## HOP-UPS



# Sledgehammer

To increase reliability and speed, I replaced the brass bushings with 12 DuraTrax\* 5x11mm ball bearings. A Futaba\* Magnum Sport radio with a Novak\* NER-2X micro receiver controlled the Hammer, and a Futaba MC-112B ESC delivered the power to a Speedworks\* 427 motor.

With the hop-ups completed, I fitted a JG\* custom-painted '91

clean it, I looked at it carefully, and these words of wisdom entered my mind: "Lower thy center of gravity!" That was it—the chassis and the body were sitting too high! While thoughts of exotic suspen-

dollar!

The first step was to lower the body, so I removed the front and rear body posts and springs. Since the front posts were shorter than those in the rear, I cut a few more coils from the springs, and I mounted them in the back. I drilled holes through the front nubs that the springs/posts went onto, and I enlarged the body-mount holes accordingly. Since my alterations weren't radical, I could easily return to the original tires, wheels and body.

Having watched the truck bounce around the track, I figured the under-dampened, over-sprung shocks were the culprits. When I removed the eight plastic shocks and

drained the oil, I discovered that five of them had cracked. I installed four DuraTrax long aluminum shocks filled with Losi 40WT oil, and I used the original Traxxas

springs. To limit the amount of travel and to provide a soft stop when the shocks are fully compressed, I installed two rubber O-rings on the internal part of the shaft and one on the external part of the shaft of each shock. I mounted the new shocks onto the truck and noticed an immedi-



PHOTOS BY JOE CALDERONE

*A custom-painted '91 Chevy truck body from JG Mfg. was fitted to the chassis, but I wanted it to sit lower, so I removed the front and rear body-mounting posts and cut a few coils from the body-mount springs.*

Chevy truck body to the chassis. On its first run, the Sledgehammer wheelied across my front yard and chased the neighbor's cat up a tree. I also went to a nearby construction site, and this truck took everything I threw at it, including some punishing 3-foot jumps.

During the following months, I used and abused the Hammer without any breakdowns occurring. I wondered how it would fare in actual competition against the JR-XT and the Ultima/RC10 conversions. Race day came, and the Sledgehammer wheelied down the straightaways, tipped over in the turns, and pogo-sticked off the jumps. Yet, I could see potential in its rugged design.

Before I took the vehicle apart to

sions and graphite chassis danced through my head, I reminded myself that any more hop-ups would have to be kept in the budget class; besides, I'm stingy with the

## HAMMER HOP-UP PARTS

- 12 DuraTrax 5x11mm ball bearings
- 4 DuraTrax long aluminum shocks
- Speedworks 427 motor
- Futaba MC-112B ESC
- JG Mfg. painted '91 Chevy truck body
- Kyosho Outlaw Ultima mini pin-spike tires
- Losi 40WT shock oil
- Futaba Magnum Sport radio
- Novak NER-2X micro receiver
- Pro-Line wheels
- Trinity 2000 stock motor
- 1 13-tooth pinion gear



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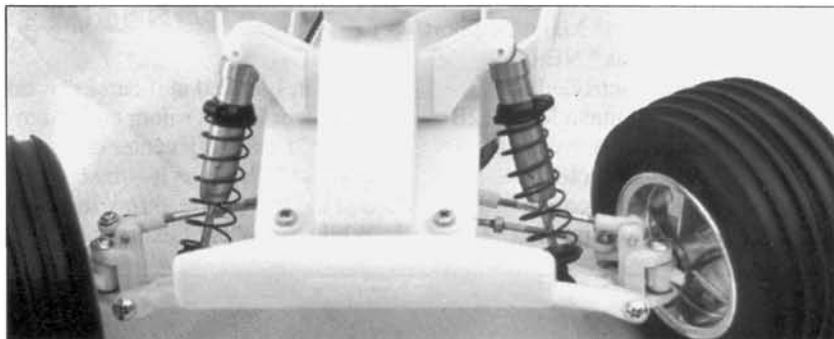
### TRACK REPORTS

**Kyosho Ferrari F40**  
**Serpent Impact 10**  
**Yokomo Works '91**

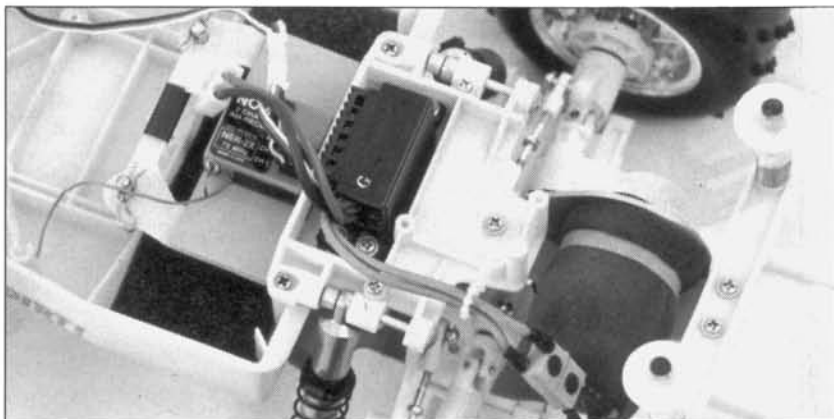
### C O L U M N S

**Nitro News**  
**Scoping Out**  
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## Sledgehammer



*To improve handling, all eight of the Sledgehammer's plastic shocks were removed and replaced with four DuraTrax long aluminum shocks. The 12 brass bushings were replaced with DuraTrax 5x11mm ball bearings.*



*For improved performance, I used a Futaba Magnum Sport radio, an MC-112B electronic speed controller, a Novak NER-2X micro receiver and a Trinity 2000 motor.*

ate difference in ride height. Make sure you put the front shocks on the back part of the front A-arms and the rear shocks on the front part of the rear A-arms—got it?

Finally, the stock wheels and tires were put aside in favor of Pro-Line\* wheels and Kyosho\* Outlaw Ultima mini pin-spoke tires. The "torquey" Speedworks 427 motor was installed in another vehicle, and in went a Trinity\* no. 2000 stock motor with a 13-tooth pinion gear.

I charged up a 7.2V SCR pack and took the Hammer for a test run at Alcraft R/C Raceways in Brookfield, OH. This fantastic facility boasts an indoor carpet track, a high-banked speedway track and an off-road/dirt-oval track. I hit the off-road track and was amazed at how well the Hammer handled! It took a tremen-

dous effort to flip it over and get it out of shape on the jumps. No, it won't beat a good driver driving a well-prepared JR-XT or conversion truck, but if you make the improvements that I've mentioned, you'll have a blast with the Hammer.

*\*Here are the addresses of the companies featured in this article:*

**DuraTrax/Great Planes Model Distributors**, 1608 Interstate Dr., P.O. Box 4021, Champaign, IL 61824.

**Futaba Corp. of America**, 4 Studebaker, Irvine, CA 92718.

**Novak Electronics Inc.**, 128-C E. Dyer Rd., Santa Ana, CA 92707.

**Speedworks**; distributed by Trinity Products.

**JG Mfg.**, P.O. Box 6014, Whittier, CA 90609.

**Team Losi**, 13848 Magnolia Ave., Chino, CA 91710.

**Pro-Line USA**, P.O. Box 456, Beaumont, CA 92223.

**Kyosho**; distributed by Great Planes Model Distributors.

**Trinity Products, Inc.**, 1901 E. Linden Ave., #8, Linden, NJ 07036. ■

## HOME-BUILT

(Continued from page 150)

\*Here are the addresses of the companies mentioned in this article:

**Parma International Inc.**, 13927 Progress Pkwy., N. Royalton, OH 44133.

**Associated Electrics Inc.**, 3585 Cadillac Ave., Costa Mesa, CA 92626.

**Du-Bro Products**, 480 Bonner Rd., Wauconda, IL 60084.

**Kyosho/Great Planes Model Distributors**, P.O. Box 4021, Champaign, IL 61824.

**Fine Design & Manufacturing**, 2 North St., Middletown, NY 10940.

**Duratrax/Great Planes Model Distributors**.

**TMS Products**, 1840 220th St., Ste. 360, Torrance, CA 90501.

**MSC Model Products**, 22 S. Balsam St., Lakewood, CO 80226.

## LAZER ZX-R

(Continued from page 56)

To race with this car under ROAR rules, you must use smaller tires because the stock 2.2-inch wheels are illegal. I picked up a set of Pro-Line\* tires for the rear and a set of Schumachers\* for the front. Then I was ready to give it a try on the track!

In the first race, I was truly embarrassed. The car was undergeared and a little on the slow side. Its steering was amazing; in fact, it was a little *too* good. Because of the increase in speed allowed by the servo and the turning ability that's typical of a 4WD car, I had some trouble driving it. It just plain turned so fast that it seemed as if it were *anticipating* my commands.

After the qualifying races were over, I had dialed-in the car better by adjusting the shock positions and changing the oil. I managed to TQ, but, as I said, the turn-out was low, so it wasn't anything to be proud of.

I installed new brushes for the Main and went up a tooth. Bad move! At the start of the race, it was apparent that the car was too fast. As I reached the turns, I kept clipping the inside walls. I was controlling it better, but the car was tough to drive. I didn't win, but I was sure that there was more tuning to be done. I decided to see how the car would drive with the kit tires and wheels installed. I hit the track all alone and began to peel off some laps. Immediately, I saw an improvement in handling. The car slid through the turns a lot more predictably, and it really seemed to have more traction.

I wish I had been able to race with the kit tires that night, but they weren't legal. I can, however, glue rubber bands to the smaller rims and use the same tires. That

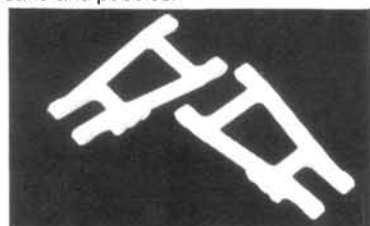
(Continued on page 162)

# RPM

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### #7030 RC10T

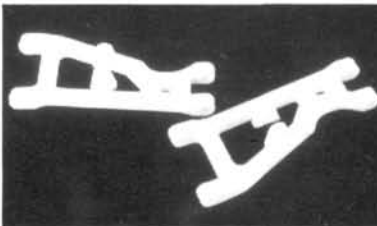
Rear Arms are direct replacements for the Associated stock arms. The shocks are mounted the same distance outward, but they're moved upward slightly to allow more down-travel and to reduce dogbone binding. Molded in tough dyeable nylon. No large frontal areas to scrape the track, or small ribs to catch sand and pebbles.



RETAIL: \$11.95/pair

### #7040 RC10T

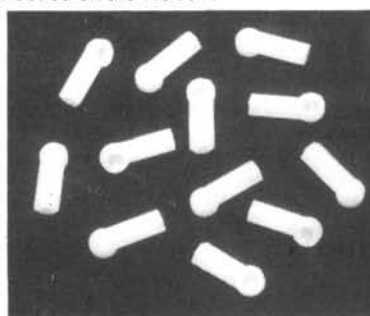
Front Arms are .030 inch longer on each side than the stock arms. They're injection-molded in a tough, dyeable nylon. The RPM aerodynamic, open-rib design won't encourage sand and small rocks to collect between the ribs. Snug fits with good free movement on the hinge pins.



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## LAZER ZX-R

(Continued from page 161)

should do the trick! Overall, I was impressed by the car's performance. With a little more tuning, I'm sure the car will do better. I'll tell ya; if you drive a 2WD car now, you should check out 4WD. It sure is different, and it's a blast!

\* Here are the addresses of the companies mentioned in this article:

**Kyosho/Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61824.**

**Hyperdrive, 3210 Howard Nickell Rd., Fayetteville, AR 72703.**

**MK Engineering, P.O. Box 216, Seymour, CT 06483.**

**Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626.**

**GPM; distributed by Hobby Etc., 295 DW Hwy.,**

**Lamplighter Square, Unit 3A, Nashua, NH 03060.**

**Dan's RC Stuff, 9525C Cozycroft Ave., Chatsworth, CA 91311.**

**Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.**

**Tekin Electronics, 970 Negocio, San Clemente, CA 92672.**

**KO Propo; distributed by Global Hobby Distributors, 10725 Ellis Ave., Fountain Valley, CA 92728.**

**Trinity Products, 1901 E. Linden Ave., Linden, NJ 07036.**

(Continued on page 170)

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## LAZER ZX-R

(Continued from page 162)

**Motion Graphics**, 2645 Robert Arthur Rd., Westminster, MD 21157.

**Pro-Line USA**, P.O. Box 456, Beaumont, CA 92223.

**Schumacher**, 6302 Benjamin Rd., Suite 404, Tampa, FL 33634.

**RPM**, 14978 Sierra Bonita Ln., Chino, CA 91710.

**Lunsford Racing**, 619 First Ave. E, Albany, OR 97321.

**Robinson Racing Products**, 165 N. Malena Dr., Orange, CA 92669.

## HYPER 10 CARS

(Continued from page 69)

\*Here are the addresses of the companies mentioned in this article:

**Hyperdrive**, 3210 Howard Nickell Rd., Fayetteville, AR 72703.

**Dremel**, 4915 21st St., Racine, WI 53406.

**Futaba Corp. of America**, 4 Studebaker, Irvine, CA 92718.

**Novak Electronics Inc.**, 128-C E. Dyer Rd., Santa Ana, CA 92707.

**Trinity Products Inc.**, 1901 E. Linden Ave., Linden, NJ 07036.

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**Atlantic Gomme**, distributed by Associated, 3585 Cadillac Ave., Costa Mesa, CA 92626.

**TRC**, P.O. Box 1058 Albemarle, NC 28001.

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**Andy's R/C Products**, 1710 Grevelia Ct., Ontario CA 91761.

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**Bud's Racing Products**, 1575 Lowell St., Elyria OH 44035.

## RC10L SS

(Continued from page 116)

straights wasn't a problem with the Trinity 13-turn double that I had aboard. It took a little dialing in before the car would track straight under power, but I think that might have been because I didn't have the front end properly aligned. I tried out the ground-effects package and ran with just the spoiler. It was a little skittish in the turns owing to the lack of banking (and subsequent downforce) in the track, but I was relatively comfortable with its handling.

I was a little concerned about the lack of airflow over the batteries, ESC and motor, so I attached a Holeshot\* Super Cooler 2001 to the motor. The batteries and the ESC got a little warm (granted, it was a very warm and humid day) so I guess that can be expected with this design.

When the running of the A-Main came around, I was fully prepared to be in the hunt. After a very competitive start, I found myself stuck in 4th place for the entire race! The three front-runners had

(Continued on page 185)



# PART III

## GET STARTED IN

# R/C

**W**ELCOME TO the third installment of *Car Action's* "Get Started in R/C" series. In the first two articles, I concentrated on choosing just the right buggy, radio system, charger and battery packs. Now it's time to put all the pieces together and have some fun.

### TOOLS

The last thing you must do before you assemble the kit is to organize your tools. As with everything else in the R/C hobby, preparation is essential. Some tools are necessary even for beginners; some make assembly and repairs easier but aren't essential for novices who are on budgets. Fortunately, you'll probably have most of the essential tools at home. Many kits include some of the more specialized tools, and this will minimize the number of new tools that you'll need to buy.

● **Screwdrivers.** You'll need a standard screwdriver and a small Phillips one. It's likely that you have a standard Phillips at home, but if your budget allows, buy a good hobby-shop-quality screwdriver. You'll also need several sizes of flat-blade screwdrivers. Again, you can usually find these around the house.

● **Allen wrenches.** These are among the most frequently used tools for assembling R/C cars. The kit will probably include Allen wrenches of the proper size. The kit tools are generally

of fair quality, but they're made of soft steel, and they'll wear out quickly. They'll get you started, but you'll eventually have to replace them. Several companies offer high-quality tools; GPM Racing Products\* offers a complete set of high-carbon-steel Allen wrenches with comfortable handles, and Bondhus\* and Du-Bro\* offer standard Allen wrenches as well as "ball drivers," which allow you to turn any Allen screw at an angle. These are useful in tight areas where standard Allen

wrenches won't fit.

● **Pliers.** You'll need two sets of pliers, and any high-quality brand will do. The standard slip-joint variety is a must, but you'll also need a set of "needle-nose" pliers to hold, push, or pull small parts in tight places. These can often do double duty, because they often have built-in wire cutters.

● **Soldering irons.** This is one important tool that you may not already have. Because we deal with electric cars, there will always be wires to solder. There are two types of soldering iron: the gun type, e.g., the familiar Weller\*, costs about \$25; the chisel-tip or pencil type, e.g., the Ungar\*, ranges from \$14 to \$130. When you buy a soldering iron, tip temperature is the most important consideration. For most R/C-related soldering, you'll need a gun-type iron with at least a 100W rating. A cooler iron takes longer to heat an area or piece to be soldered, and it allows heat to penetrate further than you need or want it to—some-

times actually damaging heat-sensitive components. A hot iron is best! A chisel-tip iron in the 700-degree or 35W range works well for most R/C soldering jobs.

● **Files.** For minor parts fitting, you'll need a small, flat, fine file. X-Acto makes an excellent set that includes several different shapes to conform to various surfaces. Don't go out and buy a fancy file set right away; nearly any small, fine file will get you started.

● **Cutting tools.** These are a must.

## The Right Tool For The Right Job

# GET STARTED

Most home toolboxes include a utility knife and a fine-tooth hacksaw, but they're often more tool than you need (using them would be sort of like slicing bread with an axe). The easier a tool is to handle, the safer it is. Likewise, a purpose-designed tool is safer than one that's designed for general application.

Hobby knives are relatively inexpensive and razor-sharp; they're perfect for removing plastic and nylon parts from their "trees" and for trimming excess plastic for a better fit. They also make Lexan body trimming and countless other R/C tasks easier. You can buy a knife that you throw away when it becomes dull or, for only a little more money, you can buy one that has replacement blades and comfortable, substantial handles. X-Acto and ProEdge\* offer reasonably priced, high-quality, American-made tools that feel right and work well. They also offer blade styles so that you can tailor the tool to the job.

A fine-tooth hacksaw will do the job in most cases, but a razor saw will cut more accurately. X-Acto makes one that's perfect for cutting nylon, plastic, and soft metal, e.g., aluminum. It has a very thin, fine-tooth blade that makes most cutting jobs easy. You probably won't need something like this unless you're modifying the original kit.

● **Rotary tools.** These are the ultimate tools. They simplify cutting, drilling, grinding, sanding, or shaping R/C hobby materials. They have chucks or collets that hold bits, drills, or grinding/sanding devices. Some rotary tools are battery-powered and very portable, which makes them perfect for trackside jobs. Dremel's\* line of rotary tools starts at about \$50, but for about \$30, International Hobby Corp.\* offers a cordless Mini Drill that can do many of the things that Dremel tools do.



*Make sure that you have all the tools you'll need before you start to build. A Phillips screwdriver, pliers, ball drivers and even a pocket knife (or a hobby knife) are useful tools.*



*Some power tools are very useful for working on R/C cars. Shown here are a mini rotary power tool for delicate work and a larger 3/8-inch drill for big jobs.*



*A high-temperature soldering iron is essential; the hotter the iron, the better!*

## PUTTING THINGS TOGETHER

Now—the moment you've been waiting for! Open the kit box, but *don't* open any of the parts bags. Read through the instruction manual before you start to build. As you read, study

the assembly procedure and the sub-assemblies. Become familiar with the major parts and how they should go together. Read the parts list and learn how the parts are organized and identified. This may save you from major headaches during assembly.

Although some builders paint the body first, I recommend that novices leave it clear until the chassis has been assembled. It's difficult to mount a painted body because you can't see the body-mounting system, the suspension parts, or any other protrusions.

Organize your workbench so that you have plenty of room to work. Put a towel down under your work area to catch any parts you drop and prevent them from rolling onto the floor or under other parts or tools. Use a parts bin for each parts bag to make finding and identifying them easier. Margarine bowls with lids are perfect for this. Empty the parts from one parts bag only into each bowl, and tape the bag identification card onto the lid.

Lay out your tools so that they're easy to reach, yet out of the way. There's nothing more annoying than having to stop what you're doing to find a tool. It's easy to lose small tools, e.g., Allen wrenches, if they're not returned to the same place after use. Finally, set up your instructions so that you can read them easily without holding them.

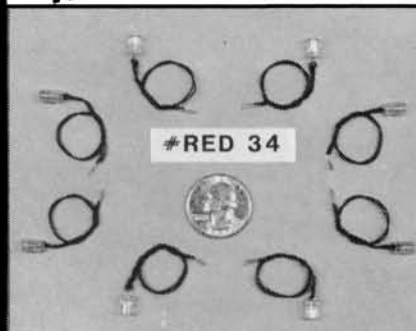
Most instruction manuals are well-written and illustrated; they're designed to get you through assembly with few problems and excellent results. Stick with the order of assembly suggested in the manual; you won't be able to complete some assemblies until you finish others. Well, all right, if you must, put the tires on the wheels first

*(Continued on page 217)*



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## RC10L SS

(Continued from page 170)

put some distance on me, but I held my own against the rest of the field, and I was quite satisfied with the results.

With the competitive fires still burning, I turned my attention to the carpeted high banks of Hobbyworld Raceway, in Plainville, CT. This is your basic warp-drive tri-oval; cornering speed is essential. Taking the right line is the key to quality lap times. I put all six cells on the car's left side. I've encountered a problem using this configuration at Megatrak (the car seems to come off the turns better with split packs), so this chassis layout could be a handicap. It seemed to do the trick here, however, because I managed to TQ (although I suffered from severe brain dump in the main and crashed hard, throwing the front end out of alignment).

## DOLLARS AND SENSE?

Was the project worth the time and investment? If you can justify spending nearly three(!) times as much as the car originally cost for a scant few seconds improvement, then, by all means, go for it! It *could* mean the difference between running first and being an also-ran. I realize that this type of project isn't for everyone, nor should it be. Nothing beats practice, patience and a quality maintenance program. However, if you want to be the first on the block...

\*Here are the addresses of the companies mentioned in this article:

Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626.

DA Graphite, 1235 Portola Ave., Spring Valley, CA 91977.

Cheetah Racing, 10823 Amestoy Ave., Granada Hills, CA 91344.

Ultra<sup>5</sup>, 650 Amherst St., Nashua, NH 03063.

Hyperdrive, 3210 Howard Nickell Rd., Fayetteville, AR 72703.

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(Continued on page 204)

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# NITRO NEWS

by JEFF BRONSTEIN

## Fire it up!

**A** LOT OF PEOPLE are now getting into nitro. After a few brief spurts of fun, they're finding that 2-stroke cars and trucks need more than just a splash of fuel and a quick spark. As electric car racers, we've been spoiled by the "plug-it-in-and-go" syndrome. We do most of our fine-tuning when the batteries aren't even in the car: discharging, charging, peaking, reflexing and then dumping. Don't give gas a bad rap just because you haven't yet learned how to max-out your performance. Two-stroke engines can be just as powerful and reliable as your best set of matched cells.

### TROUBLESHOOTIN' 2-STROKES

The best way to troubleshoot 2-stroke problems is usually by the process of elimination. Don't always assume that



*Carefully blow through each fuel line to dislodge any debris. By pinching the other end, you can find the minor splits that also cause problems.*

your engine is bad if it doesn't run well. Engine problems are often caused by something other than poor tuning or faulty equipment. Before I discuss the problems caused by poorly tuned engines and how to solve them, I'll outline other

possible problems and their causes.

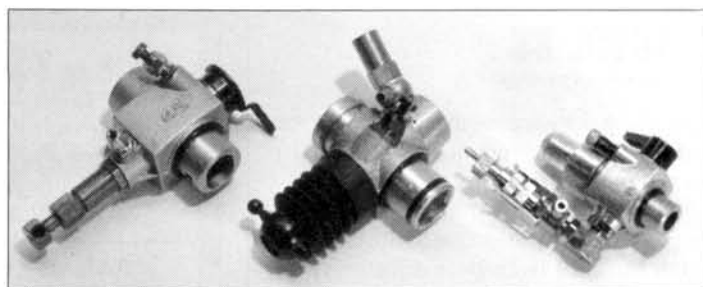
Most gas cars and trucks use fairly complicated systems of gears, belts, bearings and dogbones to transfer power from the engine to the wheels.

Drive-train components that are overly snug can cause additional drag on the engine. This can lead to poor performance, sluggish response and overheating. Eliminate as much binding as possible from the drive train and the wheel rotation. You may have to align the gear lash properly between the pinions and the spurs, or replace worn or inferior drive bearings. Just be sure that the wheels spin freely several times before they stop.

The brake/carb system is usually very effective, but if the linkage isn't set properly, the brakes might remain engaged when the carb opens, causing the engine to stall. To keep the engine running while you apply the brake, you can install a carb override spring. The brake, however, must be fully disengaged before the override will open the carb. You also have to make sure that the brake doesn't re-engage after the carb has opened completely. Check that the brake engages only when the linkage is in the brak-

ing position and that the servo doesn't travel farther than necessary to open the carb fully.

Like those on many full-scale performance cars, R/C nitro engines are air cooled, i.e., they rely on a continual flow



*Although carbs vary in size and form, they all have the same basic adjustment layout.*

of cool air over the heat-sink head to dissipate the heat generated by combustion. If the body or other parts obstruct the airflow, the engine might overheat and run poorly. Most stock-car and several GTP-style bodies cover the head partially or completely, so you must cut out the side windows or add vents. For good airflow and adequate cooling, most of the heat-sink head should clear the top of the body.

Although fuel and exhaust systems are simple, they can be the sources of basic problems. A split fuel or pressure line can cause the air/fuel mixture to vary. If you carefully blow through one end of the line while pinching the other, you might find minute splits or clogs that weren't visible. In addition, fuel residue can block the pressure fitting between the exhaust system and the fuel tank. Empty the fuel system after every use, and clean the tank and the tubing regularly.

Air leaks and clogs can also occur on



*Here's a carb with its high- and low-end screws removed; you can see how simple it really is.*



or around the carburetor fittings and the needle valve. Remove the valve carefully, and inspect the O-rings that seal it for splits. Blow through the fuel line to dislodge any debris inside the needle aperture. Also, apply a little high-temperature silicone to the areas around the fittings and the gaskets to ensure that they're sealed properly. To keep air and dirt out of the rubber air-filter boots and the slide-carb bellows, secure the overlap with a small tie-wrap.

As a last resort (before you pull out your hair!), try a different brand of glow plug and/or fuel. The glow-plug wire should always be shiny like chrome; if it's distorted, burned, or broken, replace it. Using the wrong fuel can seriously damage the engine (e.g., many engines can't run on regular airplane fuel), so be sure to ask your hobby dealer for the correct fuel for your car. Also, until you have more experience, don't use fuels that contain more than 20-percent nitro.

## TUNE-IN TO TUNE-UP

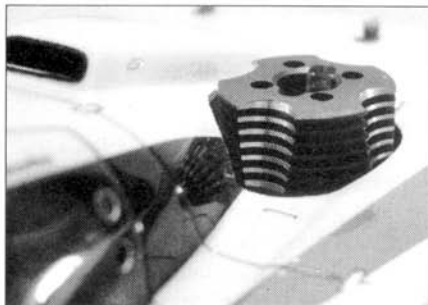
If the engine still has problems after you've checked all of these things, you probably need to tune it. In gas racing, fine-tuning the carburetor is one of the hardest skills to master. It may take time to develop a sense of whether or not your engine is running properly, but if you follow a few basic rules, you'll be able to maximize performance without sacrificing reliability.

● **Rule 1—when you fine-tune an engine, always start on the rich side (too much fuel) and slowly work toward the proper setting.** Most 1/10-scale gas cars have one major air/fuel needle-valve adjustment that affects the entire rpm range, from idle to full-tilt. For the high-end setting, start with what the manufacturer recommends (or even richer), and drive a couple of laps.

● **Rule 2—get the engine up to operat-**

**ing temperature before you adjust the carb.** This is much better than if you try to "bench-set" the carb. Pull the car into the pits quickly, and test the head temperature using the "spit test" outlined in last month's column. Close (lean) the mixture by about 15 to 20 degrees at a time (no more!), drive one or two more laps, and then repeat the test. The engine will slowly reach a point where it responds quickly and cleanly—usually when the saliva slowly boils off the head in 2 or 3 seconds. The correct setting is slightly richer than that used for maximum rpm.

● **Rule 3—take your time!** If you rush,



*You must keep nitro engines cool. The heat-sink head of this Rex helps to dissipate heat. If cooling air can't reach the head because it's obstructed, cut air vents in the body.*

you could close the needle valve too much, overheat the engine and cause permanent damage.

Sophisticated engines have extra carburetor adjustments that enhance idle, low-end and high-end rpm, but they complicate fine-tuning. Adjust the idle-speed or throttle-stop screw to produce the lowest reliable idle speed—just low enough so that the wheels *aren't* engaged. Never use the throttle linkage to set the idle.

The low-end mixture improves your car's ability to accelerate out of corners and off the line, but it's probably the most difficult setting to adjust. Once it's set, however, it should require only minimal



*If the platinum filaments in glow plugs overheat, they can bend, burn, or break. When this happens, change the plug. The filament should always be bright and shiny.*

fine-tuning. As with the high-end setting, start rich and close (lean) the mixture-control screw in small increments.

● **Rule 4—always set the high end before you set the low end and idle.** Set up the high-end needle valve as outlined, i.e., start with the manufacturer's recommended setting; drive the car two or three laps; and then stop it quickly. Let the car idle for 4 or 5 seconds, and then hammer the throttle. (You might have to set the idle slightly higher to keep the car running.)

● **Rule 5—the engine should "load-up" slightly, yet still come off the line sharply with a fair amount of smoke.** If, while idling, the engine speeds up momentarily and then dies, the low-end setting is probably too lean. If it loads up heavily and accelerates sloppily, the low-end is probably too rich. At first, make slight adjustments, and run a few laps between tests. When you're satisfied that the low end is set properly, readjust the idle-speed screw.

You'll eventually develop an ear for how the engine sounds, and you'll know exactly what to do. Until then, it will take patience and persistence to keep the engine running smoothly.

If you're a newcomer who thinks you've got it all figured out, don't bother buying a gas car. If, however, you want something new and exciting to "spark-up" your R/C racing, nitro is happenin'!

# SCOPING OUT

by JOHN RIST

## SCI Monster Card

**I**N A WORLD where monster trucks are king and "hammer-down" drivers run hot multiple motors powered by monstrous battery packs, there's a continuous search for a speed controller that's tough enough to survive. Many drivers look for one that also has fully proportional reverse. I came across one—the SCI\* Monster Card—with just such a feature. According to the sheet that came with it, the Monster Card has the same capabilities in forward and reverse because it uses the same number of FETs in both directions.

Most controllers with reverse have 12 FETs—eight for forward and four for reverse. This setup keeps the forward

voltage loss low, but at the expense of reverse. Manufacturers assume that this is sufficient because reverse is used primarily to back up when a vehicle is stuck. Some controllers even have just one speed for reverse—usually, slow.

Although such setups are OK for most, many monster truck owners have started to demand scale performance in every detail. If they've gone to the expense of buying trucks with such scale details as 4WD and 4-wheel steering, it's reasonable to assume that they want realism when they slam their pride and joy into reverse. SCI claims that the Monster Card has 16 FETs—eight for forward; eight for reverse—and that this should make reverse proportional to forward.

I examined the controller, and it appeared to be sturdy. It looks rugged because of the massive heat-sink plates that form its base. It also seemed thinner than most controllers. Its FETs lie flat so that their heat tabs contact the massive, aluminum, heat-sink base. Of course, what you lose in height you gain in length and width. This controller reminds me of a fat credit card—perhaps that's how it got its name.

The Monster Card has the following features:

- linear control at all speeds in forward and reverse;
- built-in forward and reverse LEDs;
- 16 FETs—8 forward, 8 reverse;
- a single-potentiometer setup (neutral set point only);
- a massive built-in heat sink that can handle heavy loads;
- an instruction sheet, decals, a Velcro® mounting system, a universal-receiver connector set, Tamiya-style battery connectors, bullet-style motor connectors and a 180-day warranty.

The controller's exterior was a good indicator that its interior would be unconventional. With this in mind, I removed the two screws that appeared to hold the Monster Card together. The top of the cover came off, and I could see the innards without having to take the unit apart. Peeking past the exposed edge of



the printed-circuit (pc) board, it looked as if the space between the halves of the heat sink was filled with an O-ring. I slipped a small screwdriver under it, and lifted it out to expose the lower FETs. As SCI claims, the Monster Card has eight forward and eight reverse FETs—all the metal-tab variety. This is unusual in a controller with reverse because it's necessary to keep the upper FETs insulated from the lower ones. Nylon bolts and insulating washers are used to mount half of the FETs, and this prevents shorts and provides them with a good thermal path to the heat sink.

The FET leads don't pass through the pc board. Instead, they're bussed together with heavy wire braid—a setup that should be able to carry heavy current.

I was disappointed by the battery and motor leads. Where they join, they're inaccessibly sandwiched between the two layers of the heat sink. The wires are

### • THE SCOPING OUT LAB •

John Rist's lab consists of:

- an oscilloscope
- a digital voltmeter
- a resistor load bank
- a 6V 30A electricity supply
- a Pit Stop Radio servo/speed controller tester.

The oscilloscope is used to monitor the controller's output and to guarantee that it's fully on.

The digital voltmeter takes all the voltage-drop readings and verifies the reading on the current meter.

The resistor load bank consists of 40, 12-ohm, 5W power resistors, which can be switched on and off one at a time to vary the load between .6 amp and 20 amps, but the standard 12 amps are usually used.

In series with the resistors is a 25A Simpson current meter and a 1-percent .01-ohm resistor. By measuring the voltage drop across this resistor, the current-meter's reading can be double-checked. Of course, the lab power supply provides the test current.



# EDITORIAL OPPORTUNITY

▼  
**Associate Editor**

heavy, but they're short, and they have Tamiya-style battery connectors and bullet-style motor connectors on their ends. If these are your connectors of choice, all is well. If they aren't, the attachment point will make it difficult to replace them.

The rest of the controller has miniature, surface-mounted parts—the type that's standard in the computer industry. (They enable more parts to be jammed into smaller packages.) All the solder joints looked good; in fact, I found the construction to be of a high quality through and through. I replaced the lid and headed for my *Scoping Out* lab to see whether the SCI Monster Card's performance would be as impressive as its good looks.

## VOLTAGE-DROP TESTS

I always run the resistance test first. Low resistance is important in high-voltage applications (i.e., truck pulling) because the current needed to run monster trucks is very high. With currents easily in the 20A to 30A range, even a resistance of a fraction of an ohm can cause enough heat to destroy an ESC.

I always take two resistance readings: along the entire length of the battery and motor wires (including any connectors) and 2 inches along these wires. The first reading shows how the ESC performs as it comes from the factory; the second gives a standard reading with which I compare the ESCs I test. In controllers with reverse, the reverse resistance is often high by design, so I don't usually check it. SCI, however, claims that the Monster Card's performance is the same in forward and reverse, so I tested both.

Because it's almost impossible to measure the resistance of an ESC directly, I measure the voltage drop across it while I run 12 amps of current through it. Then, I calculate the resistance with the formula: Resistance (R) = Voltage

(Continued on page 190)

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## SCOPING OUT

(Continued from page 189)

drop (V) ÷ Current (I).

The Monster Card had an end-to-end voltage drop of .42 volt—a calculated resistance of .035 ohm. The voltage drop at the 2-inch point was .30 volt—a resistance of .025 ohm. I ran the tests for reverse and the results were identical to those in forward.

Although the resistance isn't as low as that of a forward-only racing ESC (and, of course, it will cause some heating), it's in the range that I'd expect from an ESC with reverse. The big news is that its reverse resistance is as low as its forward resistance. This will provide you with two things: a smooth, controllable, yet powerful reverse; the ability to swap the motor leads if the throttle is set up backward and your transmitter doesn't have a throttle-reversing switch. In conventional ESCs with reverse, this is a no-no because it will make reverse more powerful while weakening forward.

### LET-IT-COOK TEST

This test checks whether the controller can withstand repeated 4-minute battery dumps without being fatally damaged. With the heat sinks in place, I pass 20 amps of current through an ESC for 15 minutes, but I don't provide cooling air with a fan.

Of course, heat sinks are an integral part of the Monster Card and, although not providing cooling seems harsh (the instructions warn you to mount the controller so that it will always receive cooling air), I decided to run a worst-case test. Monster trucks don't always move as fast as race cars (they're known for their crushing power, not their speed), and some people bury the ESC inside the truck to maintain the scale appearance.

After 15 minutes, the Monster Card was hot enough to burn my hand, but it still operated normally. I let it cool and ran the test for reverse. The result was the same. As mentioned earlier, ESCs with reverse have inherently higher resistances, so it's normal for them to run hot.

### DEAD-SHORT TEST

For this test, I put a jumper wire across the motor leads and ran the Monster Card for 1 minute. The current jumped to 40 amps (the limit of my lab supply), and things got hot. The battery connector was too hot to touch, the motor and battery wires were very warm, and the heat sink could have blistered my finger. Through

## SCI Monster Card

<p><b>DIMENSIONS:</b></p> <p>Height ..... 0.59 inch</p> <p>Width ..... 2.52 inches</p> <p>Length ..... 2.94 inches</p> <p>Weight with wires ..... 3.90 ounces</p> <p><b>TUNING:</b></p> <p>Access to controls ..... Excellent</p> <p>Ease of adjustment ..... Fair</p> <p><b>PRICE:</b></p> <p>Sug. retail price ..... \$255</p> <p>Warranty ..... 180 days</p> <p><b>ELECTRICAL:</b></p> <p>(Manufacturer's specs)</p> <p>Max. voltage ..... 24 volts (20 cells)</p>	<p>Min. voltage ..... 4 volts (4 cells)</p> <p>Max. current ..... 800 amps</p> <p>Continuous current ..... 210 amps</p> <p>Resistance ..... Unlisted</p> <p><b>TEST PARAMETERS:</b></p> <p>Voltage ..... 6 volts</p> <p>Current ..... 12 amps</p> <p>Voltage drop along length of wires ..... 0.42 volt</p> <p>Voltage drop at 2-inch point ..... 0.30 volt</p> <p>Resistance to end of wires* ..... 0.035 ohm</p> <p>Resistance at 2-inch point* ..... 0.025 ohm</p> <p>BEC Voltage, 6-cell pack ..... 5.88 volts</p> <p><small>*Calculated resistance = Voltage drop/Current</small></p>
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**COMMENTS:**

The SCI Monster Card speed controller with reverse is designed to work well in large, multi-motor, 4WD monster trucks. It has the same characteristics in forward and reverse, because it uses the same number of FETs in the forward and the reverse drive electronics. Most reversing controllers have 12 FETs (eight for forward and four for reverse), but the Monster Card has 16 (8 for forward, and 8 for reverse). The Monster Card got hot when I pushed it hard, but its massive heat-sink base enabled it to handle the heat without difficulty. If you're looking for a heavy-duty controller with reverse that will give your monster truck crushing authority in both directions, the SCI Monster Card is for you.

all of this, however, the controller operated normally. I let it cool and ran the test for reverse; again, the results were identical.

Although this controller doesn't seem to have a Tempfet or any other automatic thermal protection, it seems to have the capacity to survive a short. Just remember that 6- or 7-cell Ni-Cd battery packs can supply more than 100 amps. This is enough current to seriously damage anything that gets in the way, so avoid having frayed battery and motor leads. If the truck slows down, shut it off and find out what's wrong. By doing so, you'll prevent minor problems from becoming serious, expensive ones.

### TROUBLES? TRY THIS...

With all the lab tests done, it was time to pick a car in which to install the Monster Card and give it the driving test! Before I installed it, I read its one-page instruction sheet (which didn't take long). There aren't any diagrams to show how to install the ESC properly, but there's a picture of it that includes the names of its parts. I've installed dozens of controllers

and can do it without even looking at the instructions, but beginners can use all the help they can get. For this reason, I decided to pass on a few tips.

Identify the type of receiver you're using and install the matching plastic connector shell. I use a Futaba\* J-style radio connector (probably the most popular), which has "J" printed on it for identification. I inserted the plastic plug in the channel-two slot on my receiver to see whether it would fit (a procedure I recommend for everyone), and I compared the color code that's printed on the plug with the color of the wires on the steering-servo cable. The sequence of the colors was the same for both, so I was quite sure that I had chosen the right plastic shell.

I plugged the three connector pins on the Monster Card's control cable into the shell. Always compare the color of the wires with the labels on the connectors very carefully. A reversed connection could destroy your receiver and/or the controller. Also, The locking tabs on the tips of the pins can cause difficulties. The pins are square, so they can't rotate after

(Continued on page 222)



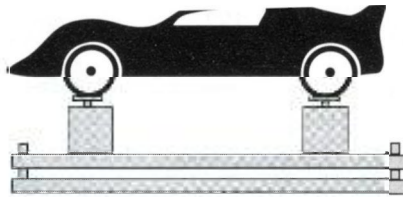
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(Continued from page 185)

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## RC12LW

(Continued from page 137)

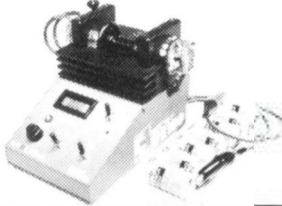
have to repeat it several times before you'll be able to push the shaft all the way into the body. If you follow the directions,

(Continued on page 217)



# SPORT

# DYNO



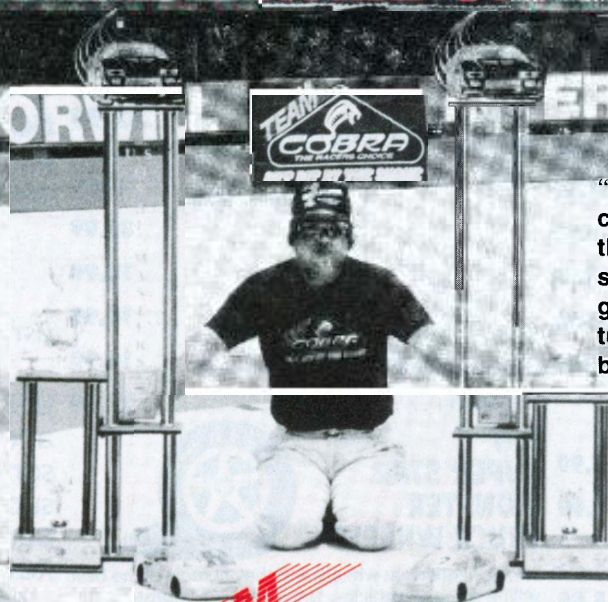
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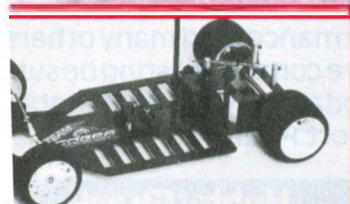


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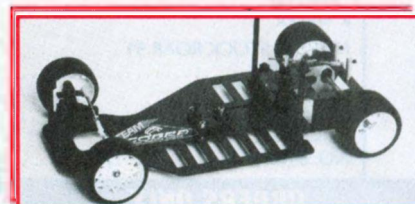
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## RC12LW

(Continued from page 204)

however, the shock absorber will operate very smoothly.

The rest of the assembly is straightforward, and the only procedure that isn't properly addressed is that for the differential assembly. (See the sidebar.) It was nice of Associated to include a spur gear, but why is it 32 pitch? I haven't seen a 32-pitch spur gear in a 1/12-scale car in years. I don't think it's too much to ask that the manufacturer include a 48-pitch spur gear in a graphite competition kit.

### FINISHING TOUCHES

To get the RC12LW on the track, you'll need a body, a motor and electronic gear. I use an Associated Nissan GTP body and a Reedy\* TRU stock motor. To run this world-class car, I chose a Novak\* 410-M1c high-frequency electronic speed controller and a Novak NER-2X receiver. I use a Futaba\* Magnum Junior radio and an S132H steering servo, and a Bullet Enterprises\* 6-cell 1400 SCR battery. To transfer the power from the motor to the graphite rear axle, I employ a Du-Mor\* 64-pitch, 100-tooth spur gear and one of

Hyperdrive's\* new Platinum Lite aluminum pinion gears. They're supposed to be 77 percent lighter than most steel gears, and they have a hard, durable coating that reduces friction. They also have the tooth size stamped onto their barrels, so there's no chance of using the wrong gear.

### HITTING THE TRACK

I put the RC12LW through its paces in one of the toughest places—a parking lot. I figured that a lot of people race 1/12-scale cars on temporary tracks set up in parking lots so, aside from the course boundaries, I was running on virtually the same type of surface.

The results? Well, as expected, the RC12LW handled like a champ. What can I say? This is a modified version of a time-tested car. Moving the batteries more toward the center of the car improved its cornering performance—especially through the "S's."

The "W" in RC12LW stands for "Worlds," and this car really lives up to its name. It already has quite a record, so there's little reason to look anywhere else for a 1/12-scale road racer.

*\*Here are the addresses of the companies men-*

*tioned in this article:*

**Associated Electronics Inc.**, 3585 Cadillac Ave., Costa Mesa, CA 92626.

**Bolink R/C Cars Inc.**, 420 Hosea Rd., Lawrenceville, GA 30245.

**Bud's Racing Products**, 1575 Lowell St., Elyria, OH 44035.

**Reedy Co.**; distributed by Associated.

**Novak Electronics Inc.**, 128-C E. Dyer Rd., Santa Ana, CA 92707.

**Futaba Corp. of America**, 4 Studebaker, Irvine, CA 92718.

**Bullet Enterprises**, P.O. Box 322, Shoemakersville, PA 19555.

**Du-Mor R/C Inc.**, 1002 Union Landing Rd., Cinnaminson, NJ 08077.

**Hyperdrive**, 3210 Howard Nickell Rd., Fayetteville, AR 72703.

**RCPS**, 18312 Gifford St., Fountain Valley, CA 92708.

**Magic Motorsports**; a subsidiary of Trinity Products, 1901 E. Linden Ave. #8, Linden, NJ 07036. ■

## GET STARTED

(Continued from page 184)

(my personal weakness).

Most manuals offer important tips that make assembly easier, so be sure to read the text and sidebars as you work. Although the tech tips in *Radio Control Car Action* can help you set up and tune your completed beauty, look for tuning tips in the manual, too.

(Continued on page 222)

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# Radio Control Car Action

# BACK ISSUES

**INFORMATION  
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## OCTOBER '91

**FEATURES:** Keep Your Stocker Screamin'; World Champs Update; Home-Built Project: Pocket Racer; SP-10 Updates; Zero-Loss is Boss; Body Detailing; Project Bulldozerhead; West Coast Monster Race; Shinwa Operate.  
**TRACK REPORTS:** Kyosho Testarossa; Kyosho Triumph; Pirate M1; Parma Days of Thunder; Corally SP-12.



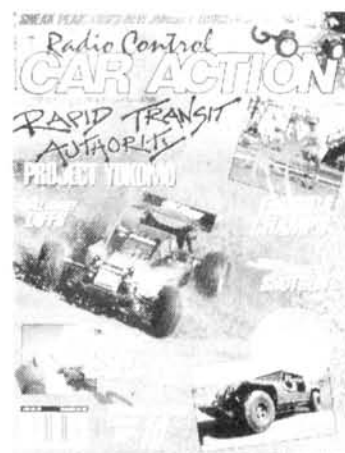
## SEPTEMBER '91

**FEATURES:** Home-Built Project: Classic Camaro; Lavco Pro Dyno; Avoid the Frequency Frenzy; Trinity Slot Machine; Painting Lexan Bodies; Wrood Wrecker; Car Action '91 Thunderdrome Preview; MRP Bud Light Tunnel-Hull Racer; Competition Electronics Stockcop; Off-Road Shock Tuning.  
**TRACK REPORTS:** Associated Team Car; Kyosho Outlaw Rampage; Traxxas Blue Eagle; Radio Review: Airtronics Caliber 3P.



## AUGUST '91

**FEATURES:** Inside Masami's Cars; Shinwa Motor Dresser Fet; R/C Facts & Fallacies; Home-Built Project: Primadonna Clod; Body Masking; IFMAR World Champs Preview; Kyosho's New Triumph; Pro-Line Ultima II Conversion; Winter Champs Winner; Pro-Line/Car Action Cactus Classic.  
**TRACK REPORTS:** Kyosho Penske PC-19; Schumacher RS 4X4; Traxxas Hawk; Tamiya Manta Ray.



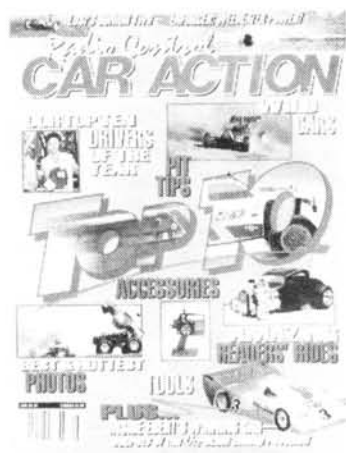
## JULY '91

**FEATURES:** NORCA/Mickey Thompson Grand Prix; Sneak Peek: Team Losi's Junior T; Home-Built Project: Flatbed Clod; Florida Winter Champs; Fusion Speed RC10; Battery Assembly Basics; Basics Of Differentials; Project Yokoma; Time-Warp: Tamiya XR311.  
**TRACK REPORTS:** Tamiya Tyrrell 019 Ford; Corally SP-10; Schumacher Shotgun.



## JUNE '91

**FEATURES:** Interview: Gil Losi, Jr.; Project King Cab: Heavy Metal Conversion; Car Of The Year; RC10 Tranny Makeover; Electric Flight Explosion; 20 Hot Motor Tips; Basics Of Glow Engines; MK Engineering Magnum.  
**TRACK REPORTS:** TRC PRO 10 Sport; McAllister MX-PRO; Kyosho Turbo Ultima II.



## MAY '91

**FEATURES:** How To Balance Wheels; Car Action's Top 10: Cars, Drivers, Tools, Tips; Florida Dirt Oval State Champs; Cleveland Indoor Champs.  
**TRACK REPORTS:** Team Losi Junior Two; Kyosho Burns DX; Associated Superspeedway 10L; Cox GTP Nissan.



## MARCH '91

**FEATURES:** RC10 Hyperdrive; New for '91; Second-Look Series: Optima Mid; Project Lynx; Kyosho 1/8-Scale World Challenge; How To Make a Winning Concours Interior; First Look: Tamiya Bullhead; Speedworks Sportsman's Cup; NR/CTPA World Championships; MIP's 4WD RC10, Part II; MRP Miss Budweiser.  
**TRACK REPORTS:** Kyosho Porsche 911; Schumacher Cougar.



## FEBRUARY '91

**FEATURES:** Time Warp: Tamiya B2B Sidecar; ROAR 1/8-Scale Nats; Holedshot; RC10LTO; Kyosho Hurricane; Kalt Whisper; Custom-Cut Graphics; Modified Motor Maintenance; Second-Look Series: Associated 10L; MIP's 4WD RC10, Part I; Canadian Off-Road Nats.  
**TRACK REPORTS:** Team Losi JRX-Pro; Tamiya Ferrari F189; Kyosho Ultima Outlaw.

## JANUARY '91

**FEATURES:** Reader's Ride of the Year; Superspeedway Shootout—R/C Thunderdrome; Home-Built Project; Inside the Winning Thunderdrome Car; ERP Magnet Zapper; First Look: Team Losi JRX-Pro; Connector Inspector; Five Years of Car Action; Candies, Flakes & Pearls; NORRCA Dirt-Oval Nats; NR/CTPA Truck Pulls; Hobby Lobby/Graupner Systems.

**TRACK REPORTS:** Tamiya Hi-Lux; Tamiya Super-G; Robbe Firefox; Marui Big Bear.

## SEPTEMBER '90

**FEATURES:** Foot Soldier; Associated Three-Piece Rims; Interview with Joel Johnson; Project Indy; Hobby Dynamics Cesa Offshore Electric; Don't Be Counted Out; Home-Built Project; The Intimidator; Pro-Line JR-X2 Truck Conversion; Sassy's Tamiya 4WD Aluminum Chassis.

**TRACK REPORTS:** Kyosho Formula 1 Ferrari; Traxxas RTR Bullet; Composite Craft/TRC Lynx II.

## MAY '90

### TOP 10!

**FEATURES:** Top Ten Cars; Top Ten Drivers; Top Ten Accessories; Top Ten Pit Tips; Top Ten Reader Illustrations; IEDA Internationals; Building It Right, Part 4; Monster Truck Racing, Part II; Top Cat Modifications.

**TRACK REPORTS:** Kyosho Sideways; Kyosho Big Boss; Schumacher Pro Cat; Bolink Eliminator Gold.

## NOVEMBER '89

### "DIRT-OVAL SPECIAL"

**FEATURES:** Project Oval Burns; Mickey Thompson Off-Road Grand Prix; Budget Racer; RC10 vs. JR-X2 Shootout; Catching the Bus; NORRCA Off-Road Nationals; JG Dirt-Oval Championship; Sportsmanship; Dirt-Oval Buyers' Guide; Side-Dam Technology; Project Panda; Dirt-Oval Motors; Kyosho Slingshot Preview; Dirt-Oval Tires; Eastern Dirt Mod.

**TRACK REPORTS:** Custom Works Dominator; Yokomo YZ-10; Parma Pro Panther 12; Kyosho Ultima Pro.

## DECEMBER '90

**FEATURES:** Christmas Wish List; Inside Cliff Lett's Winning Cars; Speedworks Sportman's Cup; Madcap Truck Conversion; Houge RC10 Conversion; NORRCA Off-Road Nats; ROAR Off-Road Nats; Catalogue Collection; Build a T-Bucket; Off-Road Wheel Roundup; Shock Waves.

**TRACK REPORTS:** Associated RC10 Championship Edition; Composite-Craft/TRC Lynx II Sport; Traxxas TRX-T Eagle.

## AUGUST '90

**FEATURES:** Days of Thunder; Budget Modified Motors; Speedworks Sportman's Cup Race; Inside Dobson's Car; Battery Dumping; Hot Rod Magazine R/C Nats; The Lavco System; Robbe Scarab; Basic Soldering.

**TRACK REPORTS:** Panda Stadium Racer; Hirobo Toyota Celica GT Four; Max Trax Wedge; Tamiya Thunder Dragon QD.

## FEBRUARY '90

### WORLD CHAMPS!

**FEATURES:** Building It Right, Part 3; Tamiya Astute Preview; C&M 1/8-Scale Cobra Preview; '89 IFMAR Off-Road World Champs; NORRCA Dirt-Oval Nats; King 8 Supernationals; Supermodified Pullers; New For '90; QSAC Nationals; Astro Drag Set-Up; Roots of R/C, Part II; Aristo-Craft Motor Conditioner; Project Sprinter.

**TRACK REPORTS:** WCM Supermodified; Hirobo Invader; Inter-Fab Viper Pro-10; Lazer Lite Quick-Change Shadow.

## OCTOBER '89

### "OPEN-WHEEL SPECIAL"

**FEATURES:** ROAR Paved Oval Nats; Victor Engineering HI-IQ; RACO Indy Car Preview; Transmission Decision; Competition Electronics Turbocharger; Indy 500; NARCTPA Grand Nationals; Li'l Deuce Coupe; Speed Metal; RCRC Super Modified; Tamiya 1/32 Mini 4WD Cars & Trucks; NORRCA Winston Cup.

**TRACK REPORTS:** Schumacher Top Cat; Craig Model SR-1 Rail; New Era East Coast Supermodified; Race-Tech Defiant.

## NOVEMBER '90

**FEATURES:** 1990 JG Oval Nats Winners; On-Road Turbo Ultima; Project Clod Buster; Masami's Yokomo; Magic Motorsports Commutator Machine; JG YZ-10 Truck Conversion; Home-Built Project: Coca-Cola Dominator; JG Lazer Truck Conversion; Home-Made Tire Truer; Preview: Tamiya Ferrari F189; Second-Look Series: Kyosho Raider; MRC Nordic.

**TRACK REPORTS:** Kyosho USA-1; Kyosho Ultima II; Tamiya Saint Dragon.

## JULY '90

**FEATURES:** Bullet Racing RC-X2; Project Master Blaster; Kyosho 1/8-Scale Off-Road Challenge; Great Planes Marine Stinger; Inside the Winning Truck; Competition Electronics Linear Turbocharger; ROAR Truck Nationals; Project 10L.

**TRACK REPORTS:** Kyosho Slingshot; Tamiya Egress; Associated RC10L; Team Losi JR-XT.

## JANUARY '90

### THUNDERDROME '89

**FEATURES:** First Report From the Australian Off-Road World Champs; Readers' Rides Car of the Year; Monster Mack Update; Car Action's East-West Oval Shootout: RC Thunderdrome; I Survived the Thunderdrome; Nitro Express; Low-Dollar Custom Trailer, Part II; Roots of R/C; Ultima Sprint Car Conversion; Building It Right, Part 2.

**TRACK REPORTS:** Horizon TQ 10; MK Engineering's MK Fueler; Kyosho RS 200; Parma Pro Panther Funny Car.

## OCTOBER '90

**FEATURES:** RoboTruck; Roar Paved Oval Nats; Roar Dirt Oval Nats Winners; Centered Energy; Bloomington Gold R/C Corvette Challenge; Trinity's New Tamper-Proof Stock Motor; Kyosho Jet Stream GP-10; Secrets of the Dominator; On-Road JR-X2; 7th Annual JG Oval Championships; Dirt-Oval Buyers' Guide; Sideways City Super 50 Speedway.

**TRACK REPORTS:** Traxxas Radicator; Kyosho Turbo Burns; Associated RC10 Graphite.

## JUNE '90

### CAR OF THE YEAR!

**FEATURES:** Car of the Year; Home-Built Project; Twister Mini Lathe; Monolithic 35Q Power Supply; GR Winter Champs; High-Octane RC10; K/N Winterblast; Clod Pulling Modifications; Tekin Reflex Charger.

**TRACK REPORTS:** Tamiya Madcap; Traxxas Bullet; Kyosho Turbo Raider.

## DECEMBER '89

**FEATURES:** Project Pumpkin; Panda Stadium Racer Preview; Kyosho Big Boss Preview; On the Scene; 1989 Off-Road Nationals; Building It Right, Part I; MK/Pacesetter R/C Nitro Nationals; Transmitter Transformation; Budget Racer; Low-Dollar Custom Trailer, Part I; Winning Concours; Cheetah QC/DC Battery System.

**TRACK REPORTS:** Aristo-Craft Wildebust; Fine Design Streamliner Rail; Delta Villain; DWA BLU 2; Tamiya Fire Dragon.

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# WHAT'S NEW



## KYOSHO Lazer ZX-Sport 4WD

The 1/10-scale Lazer ZX-Sport 4WD is an economical electric buggy with competition potential. For a serious future in 4WD racing, modelers can build on its solid design. Its light Kelron chassis houses many high-performance features: an extra-reliable twin belt drive; front and rear gear differentials; all-wheel camber adjustment; oil-filled shocks on aluminum shock towers; 2.2-inch racing wheels and tires; ball bearings and more. A Le Mans Stock .05 motor and rotary speed controller are also included.

Part no. KYOC0102

For more information, contact Great Planes Model Distributors P.O. Box 4021, Champaign, IL 61820.



## PARMA BMW M3 Off-Road with Wing

Parma now sells a beautiful 1/10-scale BMW off-road body complete with wing. The instructions make trimming and mounting the body and wing a breeze.

Part no. 10353 (clear)

Price: \$21

For more information, contact Parma International, 13927 Progress Pky., N. Royalton, OH 44133.



## MRC/TAMIYA Manta Ray QD

This 1/14-scale baby brother to the 1/10-scale Manta Ray is a terrific performer right out of the box. The Manta Ray QD comes with a pistol-grip radio. Its trigger controls forward and reverse speeds, and its wheel delivers true proportional steering control.

As well as the coil-spring suspension and 2-speed gearing, the car also has newly designed colorful wheels and paddle-spike tires for maximum grip in the dirt.

Part no. 46013

For more information, contact MRC/Tamiya, 200 Carter Dr., Edison, NJ 08817.



## DAHM'S Monster Power Pan

Dahm's new Lexan Monster Power Pan underbody is designed to fit all monster trucks that have flat plate chassis. This pan helps to keep out dirt and moisture, and it makes your monster truck more aerodynamic. It includes a Lexan supercharger (with scoop), instructions and decals.

Part no. D126

Price: \$10.98

For more information, contact Dahm's Racing Products, P.O. Box 360, Cotati, CA 94931.



## PURE-TECH RACING PRODUCTS Ultra-Thin Battery Straps

These new, improved battery straps are as thin as tape, so there aren't any clearance problems, even for 1/12-scale race cars. They're made of reinforced nylon and Velcro®, so they're strong enough for the bottom of your chassis, and they can be adjusted to hold your batteries in the slots. These hot new straps come in five neon colors as well as black.

Price: \$5

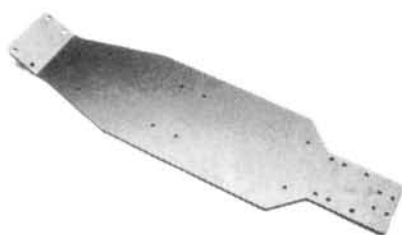
For more information, contact Pure-Tech Racing Products, 1611-A S. Melrose Dr. #180, Vista, CA 92083.



## BOLD CREATIONS PowerChek Motor Tester

With its built-in generator, the PowerChek motor tester was designed to make R/C motor testing easy. It measures real rpm, motor current and power-source voltage under three load conditions (no load, half load and full load), and it comes with a detailed set of operating instructions as well as a data log in which to record test results. All you'll need is a voltmeter and a power source (a battery, a power supply, or your model's electronics).

For more information, contact Bold Creations, 1305 Abbey Rd., Round Rock, TX 78681.



### **TRAXXAS 30-Degree Graphite Chassis**

Traxxas's new graphite chassis has a 30-degree front kick-up, and it's available for the Blue Eagle, the Hawk, the Radicator and the Bullet. The chassis is 100-percent American-made graphite that has been reinforced with cross-weave fibers for extra rigidity. Its wider base facilitates radio installation, and this chassis works with either the standard or Pro-Series transmission.

Part no. 4730

Price: \$70

For more information, contact Traxxas Corp., 12150 Shiloh Rd. #120, Dallas, TX 75228.



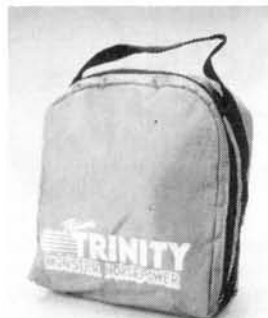
### **MINICRAFT High-Precision Drill Kit**

The Minicraft 15-ounce High-Precision Drill Kit features a 100W drill, a variable-speed transformer, a chuck key and 15 accessories for drilling, cutting, grinding, routing, shaping, sanding and polishing.

Part no. MB8571

Price: \$119.95

For more information, contact Minicraft Inc., 1 Perfection Ln., Ridgely, MD 21685.



### **TRINITY Transmitter Bag**

Trinity's Transmitter Bag protects your expensive transmitter while it's in impound or being transported. Its inner pocket can hold crystals or your transmitter-adjusting screwdriver—even an extra battery pack. All bags have serial numbers for easy identification, and they're also useful for transporting your 8mm camera, your removeable car stereo, or your radar detector.

Part no. 9032

Price: \$19.95

For more information, contact Trinity Products Inc., 1901 E. Linden Ave. #8, Linden, NJ 07036.

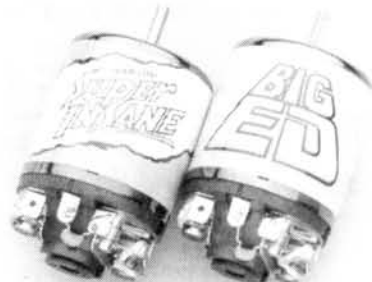


### **McLIN RACING The Fiddlestick**

The Fiddlestick lets you measure the tension of your motor brush springs precisely. Just push the Fiddlestick's special tip against the spring while it's on the motor, and read the measurement shown on the scale in the handle. You can tweak your stock springs to make their tensions what you want them to be, so why let horsepower slip through your fingers?

Price: \$12.95

For more information, contact McLin Racing, 4314 W. Hundred Rd., Chester, VA 23831.



### **TEAM LOSI Big Ed/Super Insane Motors**

Team Losi offers the latest motor technology with its newest hand-wound, modified racing motors. The Super Insane and the Big Ed feature powerful, heat-resistant wet-press magnets, thick-alloy motor cans, precisely aligned endbells and ball bearings. The Super Insane is an 11-turn missile. The Big Ed—a 15-turn brute that's equally at home at on- or off-road tracks—delivers ballistic horsepower with a broad power band. Both motors are suitable for 6- or 7-cell use.

Part nos. 6108 (Big Ed); 6109 (Super Insane).

Price: \$80

For more information, contact Team Losi Inc., 13848 Magnolia Ave., Chino, CA 91710.

Descriptions of new products appearing on these pages were derived from press releases supplied by the manufacturers and/or their advertising agencies. The information given here does not constitute endorsement by **Radio Control Car Action**, nor guarantee product performance or safety. When writing to the manufacturer about any product described here, be sure to mention that you read about it in **Radio Control Car Action**.



## GET STARTED

(Continued from page 217)

Are we having fun yet? Depending on how well assembly went, you may be having fun. Some enthusiasts get a bigger

kick out of assembly than racing; they're weird folks who often end up writing articles about R/C cars and trucks. The best is yet to come; you get to race your creation and match your skills against those of others. If you've assembled everything

correctly, you'll definitely have fun.

\*Here are the addresses of the companies mentioned in this article:

**GPM Racing Products**; distributed by Hobby Etc., 295 DW Hwy., Lamplighter Square, Unit 3A, Nashua, NH 03060.

**Bondhus Tools**, 1400 E. Broadway, Box 660, Monticello, MN 55362.

**Du-Bro Products**, 480 Bonner Rd., Wauconda, IL 60084.

**Weller**; distributed by The Cooper Group, P.O. Box 728, Apex, NC 27502.

**Ungar**, 5620 Knott Ave., Buena Park, CA 90621.

**ProEdge**, Maple Grange Rd., Vernon, NJ 07462.

**Dremel**, 4915 21st St., Racine, WI 53406.

**International Hobby Corp.**, 350 E. Tioga St., Philadelphia, PA 19134

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**"GOLD BARS" #10027**

## SCOPING OUT

(Continued from page 190)

you've plugged them into the connector shell. Insert each one so that its tab will snap into one of the three holes in the side of the connector.

The SCI Monster Card is advertised as a heavy-duty controller, so I set out to put a mega-load on it. I chose my Kyosho Sideways car. It's heavy, and its oversize tires grip dirt and pavement well. I installed a 13-turn, triple-wind Race Prep modified motor. I use this ceramic-shafted monster when I run in a 7-cell, modified,

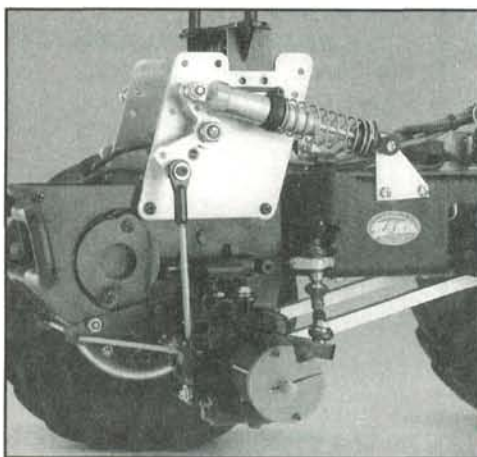
(Continued on page 227)

**HOBBICO**  
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## Innovative lineup of R/C truck accessories now includes USA-1 Cantilever Suspension System

Make your USA-1 perform like full-size stadium trucks.

- High-tech suspension system patterned after the latest full-scale monster trucks, such as Carolina Crusher™ and Bigfoot VIII™.
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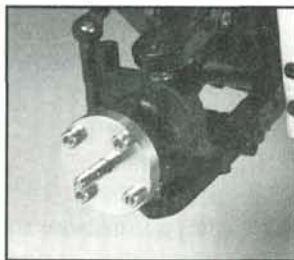
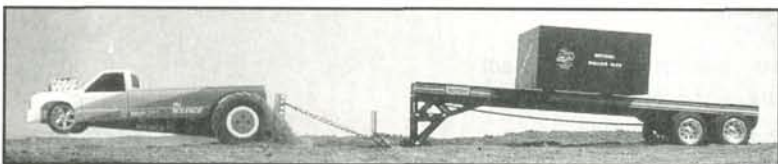


**USA-1 Cantilever Suspension System**

Also available only from MaxTrax:

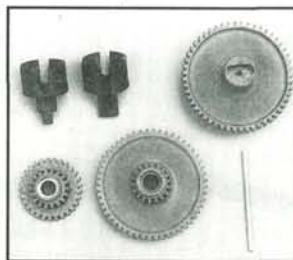
The **Wedge** 2WD puller chassis is designed specifically for competition. The official pulling sled of the NR/CTPA, the **Eliminator** has a sturdy one-piece extruded aluminum frame that supports up to 400 lbs.

Body and chrome detail engine not included in Wedge kit.



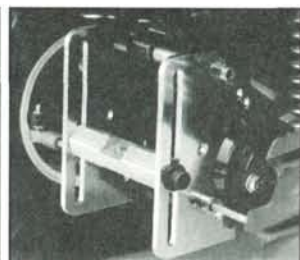
**HD Aluminum Wheel Hub Set**

Package of two fits front or rear wheels of USA-1 and all Kyosho monster trucks.



**HD Steel Gear Set**

Direct drop-in replacement eliminates differential for increased strength and traction in USA-1 and all Kyosho monster trucks.



**Hitch Kits**

Heavy-duty, gold-anodized aluminum hitches allow 2 1/2" of drawbar height adjustment—ideal for pulling competitions. Available for many popular monster truck models.



**HD Aluminum Shock Tower**

2mm aluminum front or rear shock tower set adds strength and style to 2WD Kyosho monster trucks.

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## SCOPING OUT

(Continued from page 222)

dirt-oval race. I always have trouble getting the gearing right with it because it's a power hog. Early dumps have cost me more than one race.

Installing the Monster Card was a challenge. This low-profile controller seems to cover an acre (it's intended for use with big cars and trucks). I managed to find a space large enough to accommodate this beast and, after that, mounting it was easy with the supplied Velcro® mounting system.

Next, I had to deal with the connectors. Their wires are very short, and I don't like the connectors that SCI used. I whacked off the Tamiya-style battery connector and replaced it with a Sermos\* Power Pole connector. This is my favorite battery connector because it's reasonably priced, and it has very low voltage loss. (I've never had one heat up during normal use.) I like to direct-wire my motors and eliminate motor connectors altogether, but the Monster Card's motor wires are about 2½ inches long—far too short to reach the motor. I found a Team Astro\* HyperTeck-100 connector in my collection. It's a little pricey, but even that becomes acceptable when you consider that it has almost no voltage loss, it's easy to install, and you only need one in your car.

Next, I had to match the controller to my Futaba Magnum Junior radio system. The instructions make it seem as if you only have to adjust the neutral potentiometer trim until the green forward and amber reverse lights shut off; there's no high-speed adjustment potentiometer (pot) to fool with. I don't think it's quite this simple; there are a few things you should look out for. To work properly, the Monster Card needs full throttle travel. On a transmitter such as the Magnum Junior, there's throttle end-point adjustment pots that limit the servo's movement so that it will work with a mechanical speed controller. It's very important to set these adjustments to provide maximum travel (on the Magnum Junior, set both end-point pots to no. 10). Next, I set the neutral-trim knob on the transmitter to the center of its rotation. I plugged in the battery pack and adjusted the neutral-trim pot on the controller till both LEDs went out and the motor stopped.

I pressed the throttle to full forward and checked that the car ran forward and that the green LED was on. Then I advanced

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## SCOPING OUT

(Continued from page 227)

the trigger to full reverse and made sure the car ran backward and that the amber LED was on. If you suspect that the controller isn't fully on in forward, advance the throttle trim on the transmitter until the car runs forward a little. Then readjust the neutral pot on the controller till the car stops running. This should give you more forward and less reverse. By jockeying the throttle trim around a little, I found a setting that gave me full forward and full reverse with a solid neutral.

## DRIVIN' DOWN THE ROAD

With the car set up, I was ready for some fun. I charged up a 7-cell SCE racing pack and headed for some pavement. I didn't expect the wild ride that I got with this rig. The Monster Card will go from forward to reverse *instantly*. The motor, the battery and the gearing combination that I picked provided enough power to light up the tires in both directions. Throttle response was smooth and speeds were blinding.

I drove the car for less than a minute before I realized that the controller doesn't have brakes; but it does have instantane-

ous, yet controllable, reverse. Apply a little reverse, and you achieve some braking action; apply a lot, and you bring the car to a tire-skidding stop. As I said, it was one wild ride.

I quickly discovered that I had the gearing way too high! The SCE battery dumped after 3 minutes of running. I rushed over to see if the controller had overheated and possibly destroyed the car. The battery, the motor and the controller were too hot to touch. I had inadvertently given the Monster Card a king-size handful of grief, but it took this abuse

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## SCOPING OUT

(Continued from page 232)

without as much as a whimper! (The motor and the battery also survived.)

The SCI Monster Card is a first-class controller. It's big and, as such, is suitable for monster trucks and large cars. (It would be difficult to install one in a 1/12-scale car.) My only complaints concern its instruction sheet, which doesn't offer details or diagrams to help novices, its short battery and motor wires and its connectors. These are minor complaints when you consider the power this controller can deliver in forward and reverse. The Monster Card is one of the few controllers that I've tested with full-power reverse. When you install it in a monster-crushing truck, reverse will be just as powerful and as scale-like as forward.

\*Here are the addresses of the companies mentioned in this article:

SCI Corp. of America, P.O. Box 13099, Sarasota, FL 34278.

Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

Sermos R/C Snap Connectors, Cedar Corners Station, Box 16787, Stamford, CT 06905.

Team Astro, 13311 Beach Ave., Marina Del Rey, CA 90292. ■

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